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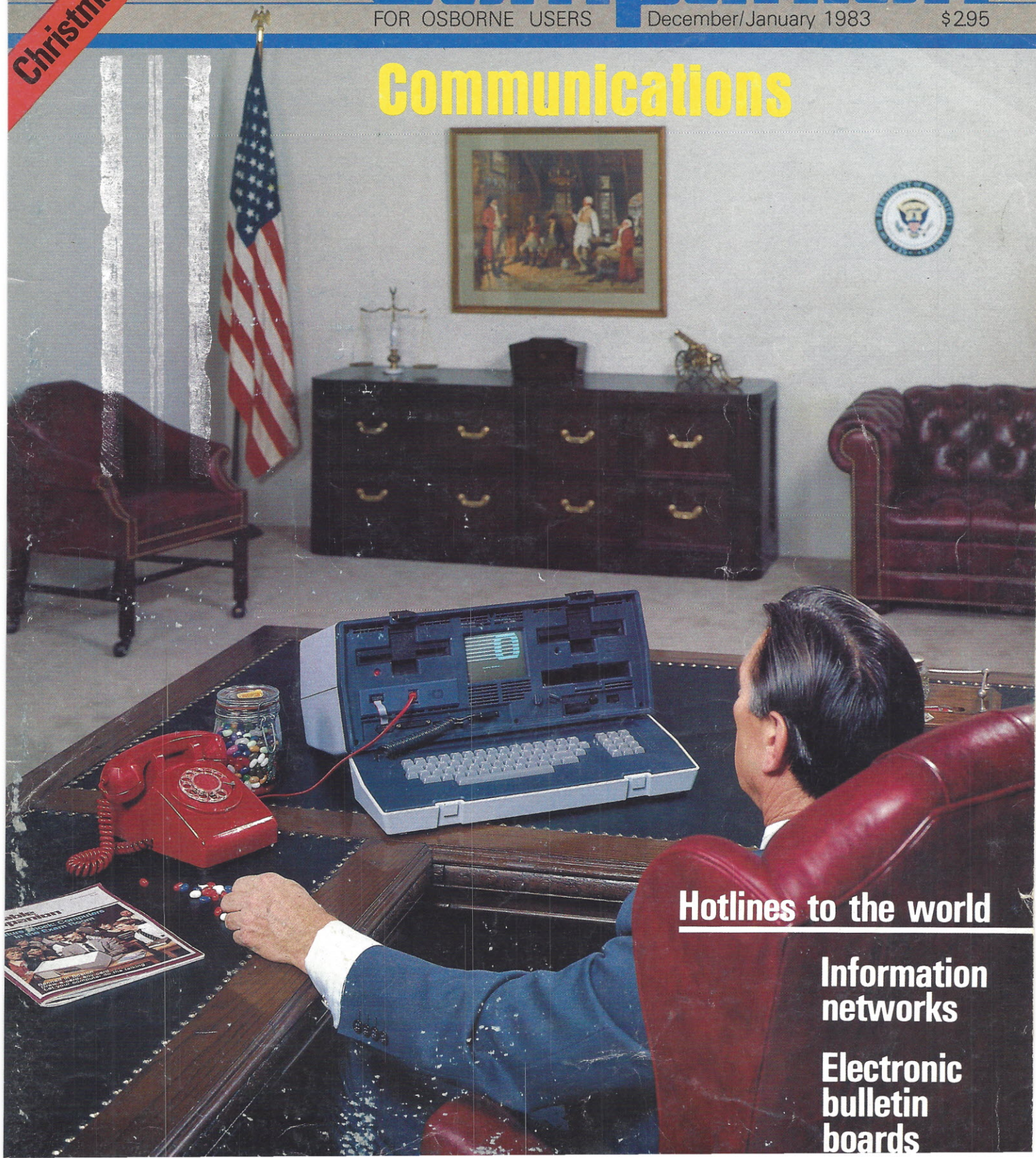
# the Portable Companion™

FOR OSBORNE USERS

December/January 1983

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## Communications



**Hotlines to the world**

**Information  
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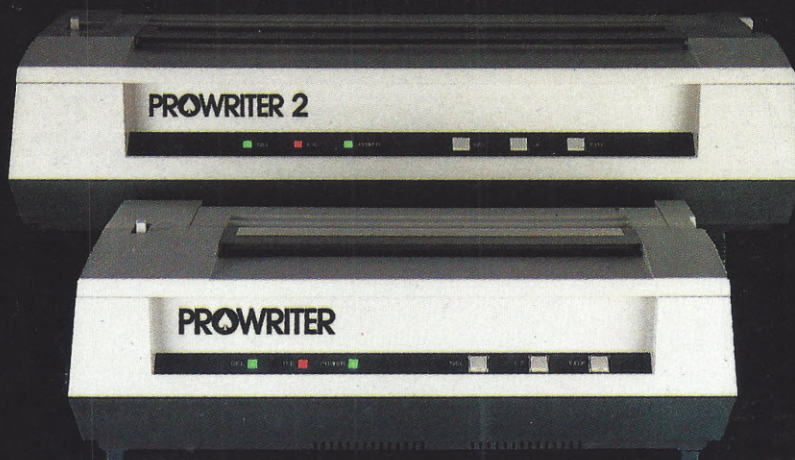
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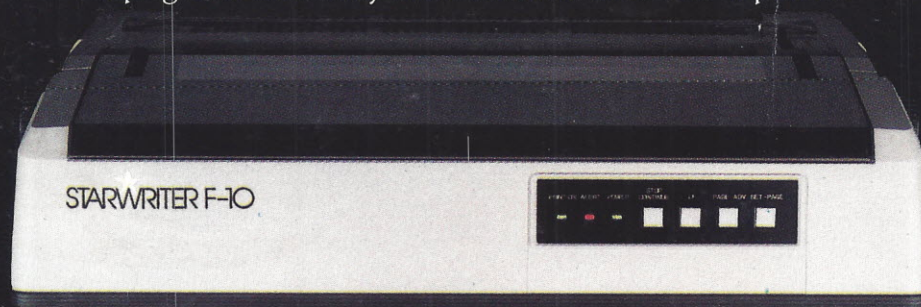
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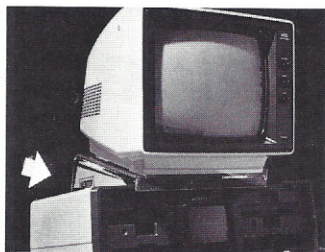
CP+ runs on all systems using standard CP/M® V1.4 or 2.2. On receipt of your order, Taurus will call you to confirm your system hardware details.  
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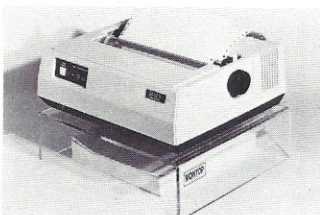


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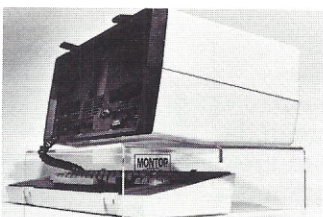
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# Start Up

It's amazing how fast things are moving here at Osborne. Some of you might not immediately agree with me, so let me explain.

I'm writing this column in late October, about the same time you should be receiving your third issue of the magazine and a letter from Adam Osborne describing eight exciting new products for the Osborne 1. I've never seen so much activity; if things were hectic around here before, we've now entered the Twilight Zone.

The products, just in case you're not on our mailing list of registered owners, are double density, 80 Plus columns, COMM-PAC (modem), POWR-PAC (battery), START-PAC (training for new users), WORD-PAC (software), WARRANTY-PAC (extended warranty), and the Technical Manual.

But products are only a part of what's happening. If you buy an Osborne modem COMM-PAC, for instance, you'll find that it's packaged in a new, very distinctive, manner. Our software will be using a variation of this packaging in the near future.

We're offering a special promotion on dBASE II for new purchasers of Osbornes. We're starting television and radio commercials in many parts of the country. We're in the process of trying to get 40 more software products to market; many are programs that are new to the CP/M and Osborne marketplace. We're working with FOG and several other user groups to get a national users' convention together. And we're producing and shipping over 2000 machines a week.

In the midst of all that chaos, I've been trying to make sure the magazine moves ahead, as well. In this issue you'll find a mini-catalog of hardware accessories you might consider for your Osborne 1. Coming soon, we'll have a complete catalog of software that is available for the machine.

You'll notice also that we're moving towards having a special theme to each issue (this issue's is modems and communications; next issue is word processing). We've added another column, dBasics, to this issue, and more will be popping up early next year. We're also getting very near to the point where we will have to make a changeover to monthly publication (so keep telling our advertisers that you saw their ad in *The Portable Companion*).

So why am I telling you all of this? Am I trying to make excuses for occasionally making a mistake or slipping a schedule by a few days?

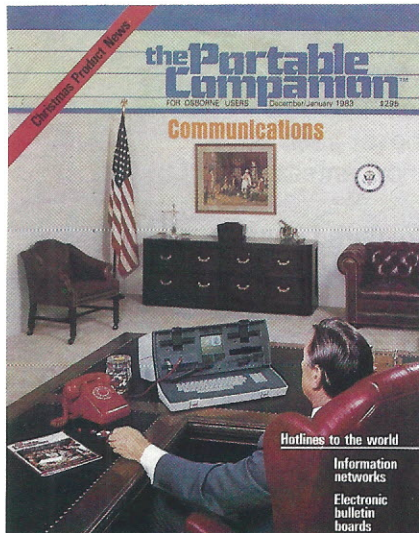
No, the reason is actually quite simple. All the activity around here tends to make life one long blur. Therefore, I decided a pep talk was in order. Not for you, but for me. . .

Thom Hogan  
publisher

P.S. Beginning with this issue we've added a number of people to our staff and shifted some responsibilities for others. Jackie Rae becomes Editor and is the person to address editorial material to; Brad Baldwin joins us as Technical Editor, coming from his previous position with OCC as Technical Support Correspondent and Meredith Ittner picks up the post of Production Coordinator.



## FEATURES



Communications... in this issue we explore networking, bulletin boards and the Osborne modem.



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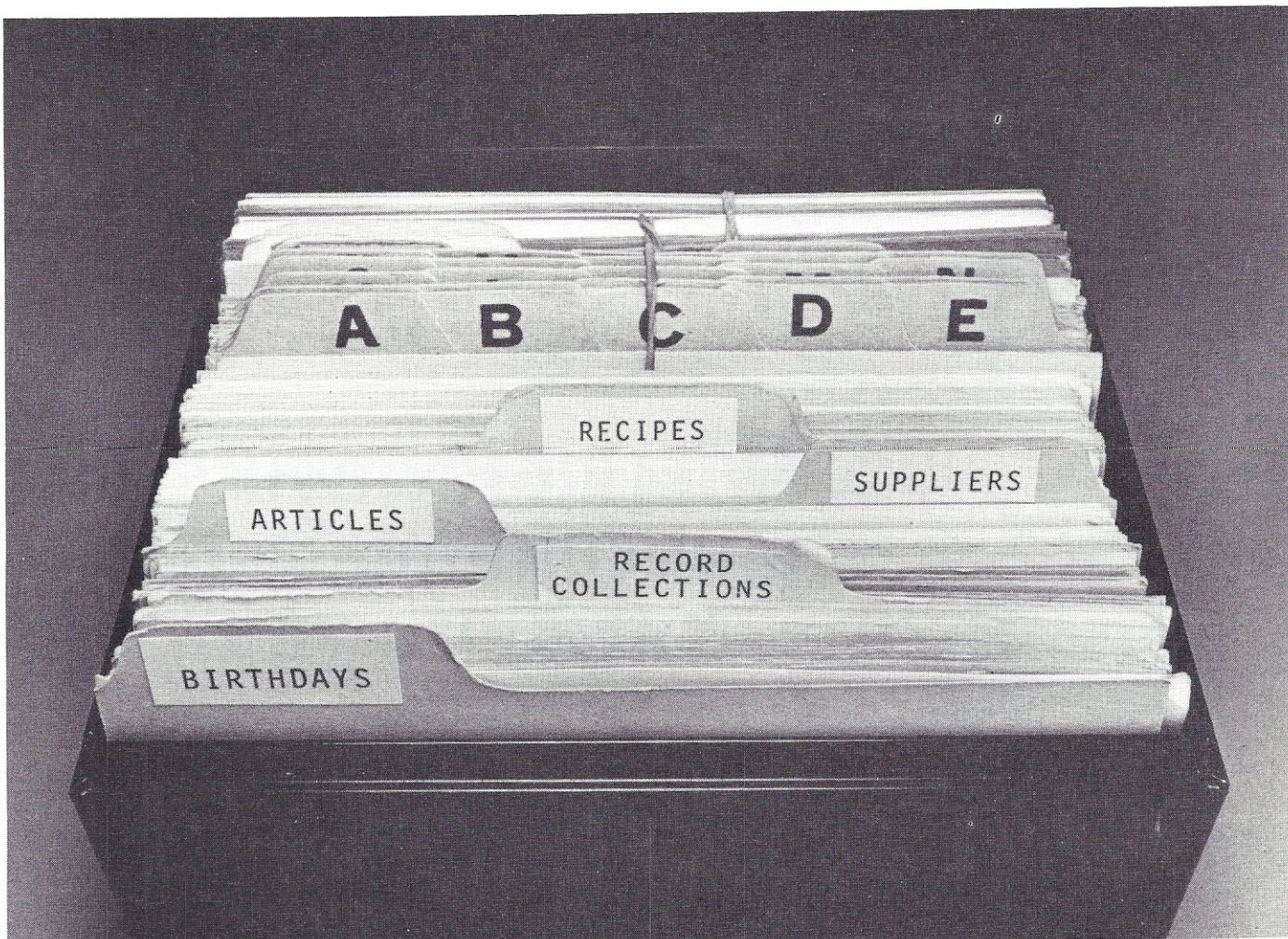
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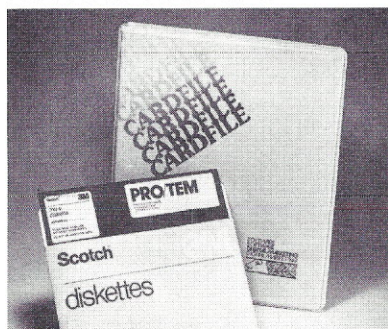
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## What do networking and communications mean to you?

Adam Osborne

To the average microcomputer user the words "networking" and "communications" are buzz words with a somewhat unsettling aura about them. Surely if everyone is talking about networking and communications, you need it. And yet you seem to be getting on just fine without either. Perhaps you are not even sure what networking and communications are all about. Are you then misusing your microcomputer? Or not using it to its full potential?

While networking and communications are very important in the world of microcomputing, they represent one of the contrary aspects of the microcomputer industry: a technology which perhaps is more talked about than needed. That is not to say we do not need networking or communications, we do. It is just that the need is perhaps less than the talk.

Communications within the microcomputer industry, as the word would imply, simply represents the ability to transmit or receive information, usually via telephone lines. Your microcomputer is at one end of the transfer; another microcomputer will be located at the other end. A number of microcomputers and/or computers communicating with each other constitute a network.

Information is communicated bet-

ween computers and/or microcomputers, using very specific data patterns. These data patterns allow the transmitting and receiving ends of the transfer to identify the point at which information begins and ends, and sometimes to identify the type of information being transferred. Generally, we refer to these codes as communications protocols. All kinds of incomprehensible and arcane terminology are used to name these protocols.

Before the advent of the microcomputer, there were minicomputers—and there were terminals. Minicomputers and terminals still exist, of course, but the microcomputer now straddles the product spectrum between these two devices.

A minicomputer today differs very little from a microcomputer. The minicomputer is perhaps larger physically, or more capable electronically, and certainly costs more, but that is all. A terminal, on the other hand, differs from a microcomputer and a minicomputer, in that the terminal cannot be used on its own. You use a terminal to access a computer—using communications. Without communications, therefore, you cannot use a terminal.

Today, many microcomputers are used as terminals, communicating



with larger computers. When used in this fashion, the microcomputer needs communications capabilities. Many users who have spent years working with large mainframe computers, today use microcomputers as terminals and lose sight of the fact that all microcomputers are not terminals. Therefore, all microcomputers do not need communications capabilities.

But you do not have to be using your microcomputer as a terminal in order to have need for communications. A whole range of obvious and ingenious uses have been found for communications and networking within the microcomputer industry. Many users transmit information between each other, devising their own form of electronic mail, or perhaps

becoming the computer version of ham radio operations. Then there are information and communications services such as THE SOURCE, which act as collecting points for large numbers of microcomputers. These services have not done well financially, since only the most dedicated microcomputer enthusiasts transmit information among themselves using such services, while the information they provide is enough to choke any normal mind.

Getting carried away with the concept of communications, newspapers have occasionally come up with the hair-brained scheme of letting you read the news on your computer screen, rather than off the printed page—only to discover, very quickly, what a hair-brained scheme this is.

Why then has communications been so over-sold in certain quarters?

The answer, very simply, is that more and more people are buying microcomputers as business machines: consumer electronics products that make typing easier or financial calculations less painful. Vast new markets are being opened up by microcomputers for applications that may replace the typewriter or the desk top calculator. In all probability, the vast majority of microcomputers will be sold into such applications within the next few years, and this vast majority of microcomputers will have no need for communications.

Which is not to say that communications is unimportant or likely to die out.

The point I wish to make is that the microcomputer industry is growing so fast, and in so many directions, that of necessity many buyers will never need communications capabilities and need not feel uncomfortable about doing without. For those who do need communications, the hardware and software is cheap and readily available. It is getting cheaper and more readily available all the time, so don't worry about it.

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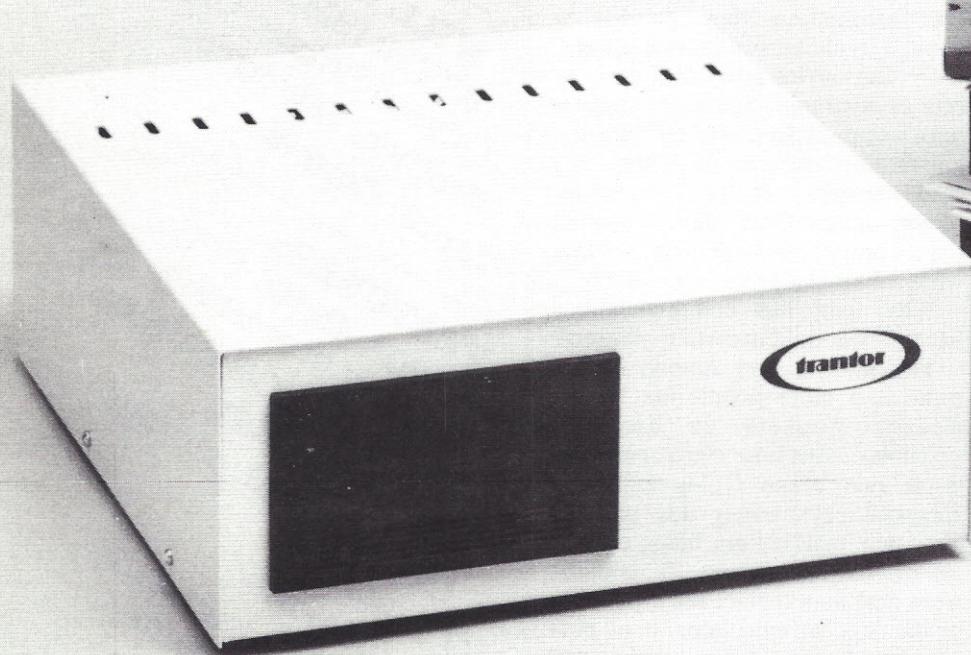
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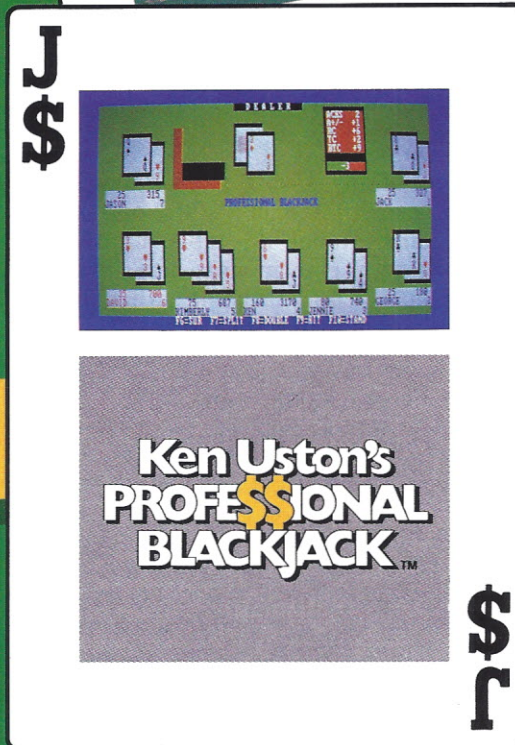
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## Letters

### The Cover that Shook the World

Your premiere issue was sent to the former occupant of our address, and we were absolutely delighted with your cover! Granted your thinking is computers, not news coverage, but you have done what no major news magazine in this country has done, and that is a cover featuring the freedom fighters of Afghanistan. In that you have done a great service.

We appreciate your bringing, in your own special way, an awareness of the struggle for freedom and self-determination in Afghanistan to your readers.

Karen McKay  
Executive Director

Committee for a Free Afghanistan  
Washington, D.C.

### User's Guide Clarification

On page 237 of the MBASIC section of my User's Guide, there is mention of the /F:, /M:, and /S: commands but no explanation on how to use them anywhere in the manual. Can you clarify what they are and how they are used?

Martin Murray  
Dallas, Texas

*Those commands are options used in the initialization of MBASIC programs.*

*/F: is the option for setting the number of sequential or random disk data files that may be open at any one time during the execution of a BASIC program. If the /F: option is omitted, the number of files defaults to 3. Each file data block requires 306 bytes of memory. The maximum number of files allowed is 15.*

*/M: sets the highest memory location that will be used by MBASIC. Programmers use it to reserve space for their assembly language sub-routines by setting up memory below Osborne's reserved memory location (CF00). If the /M: option is omitted,*

*all memory up to the start of DF00 is used.*

*/S: sets the maximum record size for use with random files. The default size is 128 bytes.*

*Examples:*

*A > MBASIC /F:8 Use 8 files.*

*A > MBASIC FILE-NAME/F:2 Use 2 files, execute FILE-NAME*

*A > MBASIC /M:&H90A0 Use memory up to hex address 90A0*

*A > MBASIC /S:100 Set maximum record size to 100 bytes*

*A > MBASIC FILENAME /F:12 /M:&HAF00/S:512*

*Note that decimal, octal (&O), or hexadecimal (&H) numbers may be used.*

### A Troubled Reader

I was about to send my \$100.00 off for a software package entitled "Write Track," put out by a "Gradan Consulting Company," when I noticed that their ad had not included a phone number (page 89 of the August/September issue). I then called information to find out if there was any listing for the company. There wasn't.

Now I ask you, why couldn't this be some flim-flam operator who'd just take my money and run? What I'm getting at is that I don't think you screen your ads closely enough. Your prompt attention to this matter is appreciated.

Adam Thomson  
Fayetteville, N.C.

*Mr. Thomson raises an important issue. However, he incorrectly identifies the "suspect" announcement as*



an advertisement. In fact, this announcement was included in the *NEW PRODUCTS* section. Material for this section is culled from numerous press releases we receive in the mail.

A disclaimer appears at the end of this section stating that we do not edit submitted material before publication. We think it's inappropriate to edit material submitted regarding the release of a new product—to do so could lead to judgement calls on our part that might not be in the best interest of our readers (i.e., in the case of products that compete with those distributed by OCC). Material in this section is run on a first-come, first-serve, space-available basis, and in all fairness we cannot differentiate between products on a subjective basis.

In future issues we will attempt to provide telephone numbers whenever possible, however, some manufacturers do not accept phone orders. It is always best to write or call the manufacturer for complete details on the product before purchasing it.

#### Printing SuperCalc files

I entered the expense report Calc-Aid published in the August/September issue of your magazine. This is a great idea and you should be able to publish these for years, but I do have one question. How do I print SuperCalc files without the column and row numbers showing?

Fred H. Coats

West Chester, Pennsylvania

While in SuperCalc, use the sequence of commands /GB as a toggle switch to turn the borders on and off.

#### dBASE II Controversy

I have just discovered that new purchasers of the Osborne computer are receiving a disk of Ashton-Tate's dBASE II, a program that I would like to have and would have to pay

for at well known rates. It seems that this offer is supported by head office as proof of purchase must be submitted to head office to quality.

I can go along with dealers giving discounts to attract business, and frankly whatever the dealers do to get business is up to them. But I must admit that when I see this kind of deal I am a little affronted.

Peter Chapman  
Victoria, B.C.

This issue has been raised by a number of our existing owners and we would like to address it head on. Osborne Computer Corporation prides itself on its aggressive pricing and remaining on the leading edge of the technology. We introduced the first computer priced at less than half the cost of our competitor's products—and with software to boot! We intend to maintain that posture now and in the future. The dBASE II offer is one more example of OCC's aggressive stance on pricing.

These kind of sales promotions are common in all aspects of retail sales and computers are no different. Mr. Chapman must also acknowledge that as technology is fine-tuned and marketed to a wider audience, prices usually go down. A recent example is the Video Recorders introduced several years ago; the price tag on today's models is considerably lower than when they were first introduced AND the technology is better.

Mr. Chapman's computer has undoubtedly paid for itself many times over and has certainly not lost value due to this sales promotion. On the contrary, all Osborne owners will benefit from future promotions on other software packages (such as the WORD-PAC offer advertised by OCC in this issue). We will continue to introduce products like the COMM-PAC modem, which is priced significantly lower than modems offered by our competitors.

Wherever possible OCC will continue to give consideration to its established customer base to "share

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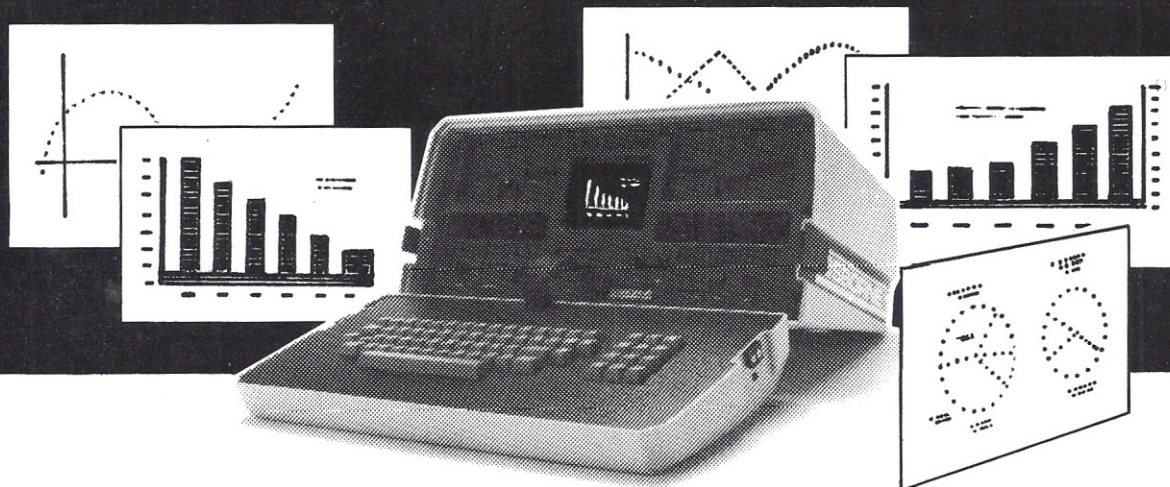
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# Letters

the wealth," as and when we enjoy price reductions. In the case of dBASE II the contract with the author clearly restricted our promotion's aggressive pricing strategies in customers purchasing within a restricted period of time.

In conclusion, we can only remind Mr. Chapman that he has benefited from Osborne Computer Corporation's aggressive pricing strategies in the past, and he will continue to do so in the future.

Georgette Psaris  
Vice President of Marketing  
Osborne Computer Corporation

## All the Details on C-Itch

Thank you for *The Portable Companion* premiere issue. Although I have been enthusiastic about my Osborne since last November, somehow getting that well-done publication finally cinched the deal. If all these reasonable, intelligent people are choosing this machine, it must have been a good move.

In the first issue you promised to send Al Frank of Santa Monica some information on connecting his C.Itch F10-40 to the Osborne 1. Would it be possible to shoot me off a copy of the same info? For nine months I've been living with a bidirectional printer that won't!

Dan Mielke  
Bethel, Arkansas

We have received dozens of letters requesting the information we sent to Al Frank, and unless we want our copier to die an early death, we better print all the necessary interfacing information here.

An extra bonus is that the C.Itch F10-40 and Transtar 140 serial daisy wheel printers are identical to each other with respect to components and even outward appearance, so the following interfacing information applies to both. (We kill two printers with one stone.)

For simplicity, the cable is stan-

dard RS232C fare using pins 1-8 and pin 20 connected straight across. Three data protocol systems are jumper selectable inside the printer:

- 1) RDY/BSY;
- 2) XON/XOFF;
- 3) ETX/ACK

The printer is usually shipped new with RDY/BSY preselected. We recommend staying with this protocol. As you may already know from reading your printer manual, all six jumpers should terminate on "N" lettered pins for RDY/BSY protocol. Do not assume they are properly set!

The next item of interest are the internal DIP switch settings on the printer:

SW	SW
401 CLOSED	411 OPEN
402 OPEN	412 OPEN
403 OPEN	413 CLOSED
404 CLOSED	414 OPEN
405 OPEN	415 CLOSED
406 CLOSED	416 OPEN
407 SW protocol	417 OPEN
408 CLOSED	418 CLOSED
	419 OPEN
	420 N/A

Now, use *SETUP* to configure the printer for 1200 baud and *SERIAL* printer. There is a way to get micro-justification, super/subscripting, and bi-directional printing. Run *WordStar's INSTALL* program and use the "QUME SPRINT 5 DRIVER" option located on the printer menu. The F10-40 requires the 45 CPS patch given in the next letter!

I have a C.Itch Starwriter which I cannot get to bidirectionally print, or do super/sub scripts and microjustification. Any suggestions?

John S. Mercer  
Amesbury, Massachusetts

We'll assume you want information on the C.Itch Starwriter FP-1500 25/45 or the C.Itch F10-40 (which uses the 45 CPS patch on the next page).

The C.Itch Starwriter 25/45 is not seen too often anymore, but they do generate quite a few inquiries. There

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Dealer inquiries invited.

## Letters

are two models: the 25 CPS and the 45 CPS units. (CPS = characters per second.) This printer requires the following WordStar patches in order to get all the things you want:

**25 CPS model:** Change addresses 0797 and 07A1 from 7E to 63

**45 CPS model:** Change addresses 0797 and 07A1 from 7E to 7A

Use **INSTALL** to select "Qume Sprint 5" from the printer menu. Use the Osborne configuration program **SETUP** to configure the disk for **XON/XOFF** or **ETX/ACK** protocol. The cable is standard RS232 fare.

Has anyone gotten WordStar to print superscripts and subscripts on the Epson with Grafrax-Plus? I have tried modifying (via **INSTALL**) subroutines **USR1:** through **USR4:**, **ROLDOW:**, and **ROLUP:**, and have so far been unsuccessful.

Jenifer Robertson  
Derby, Kansas

The Epson printer manual is in error. The hex codes listed from decimal 81 to 87 are incorrect. 5D should be 53, 5E is actually 54, and so on.

### More on Double Density

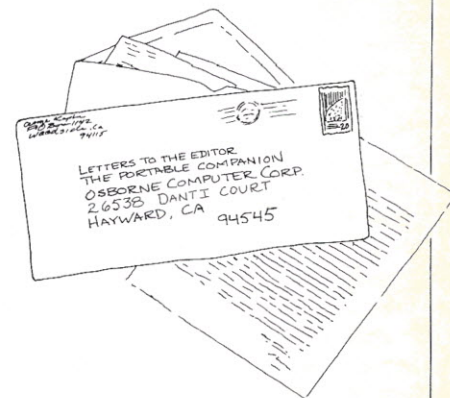
The next issue of The Portable Companion ought to contain a full and complete explanation of the circumstances surrounding the delay of "Dual Density (double density) Disk Controller Option." You have loyal customers and owners who have waited patiently through several announcements.

D.M. Hurst

A full explanation of the reasons behind the delay in releasing the Double Density Option was included in the WHOOPS section of the August/September issue (page 94). A letter has also been sent to all registered Osborne 1 owners from OCC, explaining the procedure for upgrading to the new 80 Plus Column and Double Density options (see **NEW PRODUCTS** for announcements).

If you did not receive a letter it may be that your warranty card was not properly registered. Write to OCC for the proper documentation to include your name on our mailing list (serial # must be included) at:

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### THE PORTABLE COMPANION NEEDS YOU!

We're on the look out for writers, photographers and reviewers to contribute to *The Portable Companion*. Please send in your hardware and software reviews, features, and applications stories on the Osborne 1. (include your diskette for a fast response) We are also soliciting material on using the computer in a business environment. Write for a copy of our "Writer's Guidelines" at:

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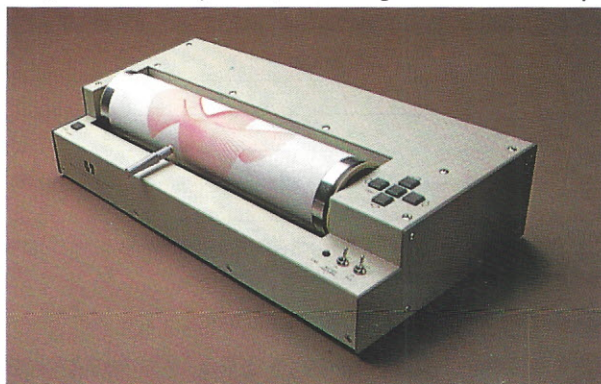
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*the Wizard  
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## Tougher and Tougher

Thom Hogan

The questions to the Wizard are getting tougher all the time. I take that to mean one of two things: either this magazine and other support efforts of Osborne have had some effect on getting rid of the simpler questions, or you're all out there trying to find one that will stump me; I sure hope it's the former and not the latter.

I must start this column with an apology to many of you. Most of July and August I was out of the office, both on vacation and making the local lecture circuit. Unfortunately, this coincided with the onslaught of mail that arrived due to the appearance of the first issue of *The Portable Companion*. When I finally got around to tackling my correspondence in September, I found that I had a stack of over 500 letters to answer.

Here it is mid-October (as I write this—you should be reading this in December) and I find that I still have a way to go to finish answering the letters that just cried out for an answer. My apologies to everyone who wrote expecting a quick answer.

Now, on with the show...

By now all of you should know about the status and availability of double density. One persistent question I've already received is **Why wait until January?**

There's no simple answer to this question. Some of the factors that are

involved are: 1) We had already planned a move to new facilities in mid-November. Have you ever tried to move 300+ employees simultaneously while still maintaining the business status quo? It was felt by all the decisionmakers at Osborne that to attempt to update machines in the middle of this move would be insane. 2) Many of the dealers we approached asking about how to get double density out smoothly in turn asked us to avoid requiring them to handle updating or shipping machines in the middle of their Christmas rush. November and December are traditionally the two biggest "selling" months of the year for computer dealers. 3) Our supplier of parts could not promise us enough parts to satisfy all the demand for double density if we began shipments as early as November. We used the extra two months as "buffer" time to allow us to build an adequate supply of the boards before starting the update process.

These are only some of the factors we had to take into account. I'm not trying to give you a glib sidestep of the issue, as some of you have accused me of doing about previous statements concerning our policies and decisions. Personally, I wanted to get double density out the door quickly.

What I find fascinating is that I've received at least a dozen letters



recently that accuse us of deliberately withholding double density and 80-columns from the marketplace. What in tarnation for? I can't think of one rational reason for that attitude. Double density and 80-columns are MONEY-MAKERS for us, so why would we want to hold off shipping them? Does anyone really believe that we want to dissatisfy current customers while attempting to win over new ones? Hogwash.

**When printing from WordStar onto my General Electric Terminet 300 (albeit old, but reliable) printer, the only way I can create a blank line on a single-spaced page is to fill a line with spaces or tab the cursor to the far right and put a period or other character in front of a carriage return. What's the problem?**

Without having a Terminet around to test my theory on, I can't give you a definitive answer, but I'll take a stab or two at some possibilities.

The first possible explanation is that the Terminet is not "seeing" the carriage returns. This could be due to any number of causes. It does see a carriage return when it follows spaces, however, I hope this doesn't mean that the Terminet never prints consecutive carriage returns (actually line feeds followed by carriage returns to the computer, but those of us schooled in typewriter notation speak of a carriage return as the entire action of going down one line and returning the carriage to the left margin). If the Terminet won't print consecutive carriage returns, your solution is probably as good as any.

A more likely possibility is that the action of moving the print head to the left margin and going down a line takes more time than it takes to "see" the next character. In short, the Terminet never sees the next carriage return because it was too busy moving the print head. The reason that it works to add spaces is that the Terminet must have some sort of buffer to store an entire line before printing

it, although this is not absolutely necessary for this explanation to be correct.

If this second explanation is the correct one, there is a simple solution: send the printer characters that it will ignore before ever sending a carriage return; these are normally referred to as "null" characters, since nothing happens when they are received. Adding nulls works because it takes time to receive them, and time is what the print head needs to get back into position.

So, how do you send the printer more nulls? You use the INSTALL program as described in this issue's **Processed Word** column, and change the value at LABEL PSCR: (location 06A1) from its present value of 02, to something higher. If you haven't installed WordStar so that it recognizes how to do half-height line feeds, you can make the value as high as 0C (that's 12 in decimal). If you have installed the half-line feed function, you may only enter numbers up to 06.

**How can I change the PIP filename[n] function so that it prints the number of every fifth line in the left margin, instead of printing every line number?**

Most legal documents use the format you describe. Neither PIP nor Enumerator (a program sold under the Approved Software program) provide the results you want.

Fortunately, a program is coming that answers your needs: Lawmate. Lawmate is a combination of Documate, Enumerator, and some other ideas put into one complete package for use by lawyers. Modifications of the Enumerator function are made to accommodate the change you request. It is not yet known whether a new version of Enumerator will be made incorporating the changes.

**I've found that there is a difference in the performance of my Osborne 1 when plugged into a grounded circuit in the addition to my home versus**

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## the Wizard of Osborne

**when I plug it into the non-grounded circuit in the main part of my older home. Is this normal?**

It's hard to give you an accurate answer without seeing your home. I, too, have an older house (built in the 30's) that has been added onto. I've never had any troubles with the electrical circuits here, despite the fact that, at times, I've had as many as four Osbornes, a hard disk, and a printer, all plugged into the same circuit (not my normal mode of operation—I was helping test some new options that day). Theoretically, the amperage I had plugged into the circuit should have blown the 20-amp fuse, but it didn't.

On the other hand, I lived in a newly-rewired home in Indiana for two years, where I had nothing but problems with the electrical circuits. I had to turn my computer off and not use it anytime the air conditioner was on, or anytime electrical (thunder) storms approached the area. I installed a line filter, which helped some, but not entirely.

Let's attack the problem from a theoretical, not anecdotal base, however. Your Osborne is looking for 115 volts of alternating current, and wants them to be transient (noise) free. You should have at least 4 amps of voltage available. These three factors can be compromised in many ways.

The assumption that you have 115 volts coming into your house is one that isn't always correct. I once installed a computer system that had no end of problems, until we one day happened to measure the line voltage coming in and found it to be 92 volts! The solution in this case was to put a voltage regulator into the building. This only solved half the problem, however, as the voltage regulator can't cope with voltages that get too low, like in the low 80's. If you suspect this is your problem, the power company in your area is your best source for help.

Transient-free lines are hard to

find. You've all seen the TV screen break-up when someone nearby runs a drill or other motor-driven device. Think of the same effect coming through your electrical cabling as spurious noise in addition to the 115 volts. We've installed a line filter into the computer to take care of some of this problem, but again, the quantity or severity of the problem can override this feature. The biggest creators of transients are large appliances, especially if old, or typewriters. If you get BDOS errors infrequently, and they seem to only occur at one location (i.e., if you plug it into a different circuit and everything ALWAYS works fine), look to see what else is operating in your house.

Last, the amperage draw of the Osborne must be looked at. The standard circuit breaker in most homes is either 10, 15, or 20 amps. The Osborne, as worst case, draws 4 of those amps. If you have two Osbornes and a printer plugged into a circuit with only 10 amps rated load, you should expect unpredictable results, or worse yet, frequent shut off of the current when the circuit breaker does its job.

To put my answer into a series of things you should consider doing, here's what I would try if I suspected electrical problems interfering with the operation of my computer; I list these items in order in which I would attempt them:

- 1) Make sure the computer is grounded.
- 2) Isolate the computer on its own circuit.
- 3) Plug the computer into an additional line filter.
- 4) Try turning off major appliances when computing.

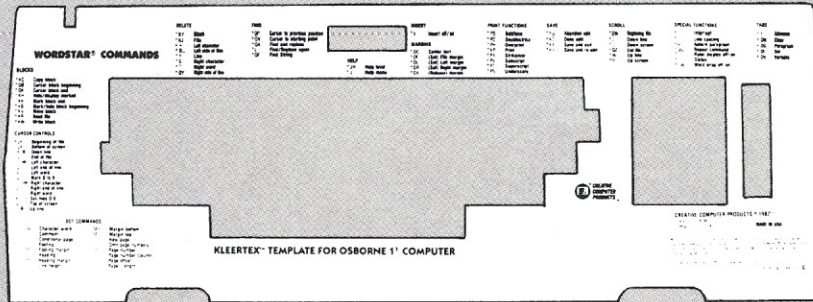
If any of these four things have any effect on the problem, I would probably consult with an electrician to have my home checked for possible wiring problems.

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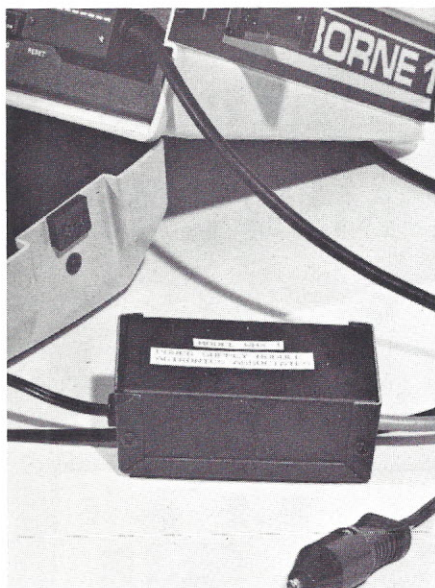
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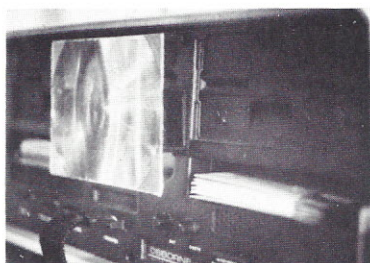
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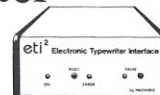
The average microcomputer "moves" data at 120,000 characters a second. A typical disk drive transfers it at 27,000 CPS. Most printers however plod along at 100 CPS and many modems squeak out 30 CPS. That's quite a drop in efficiency not to mention a waste of computing power!



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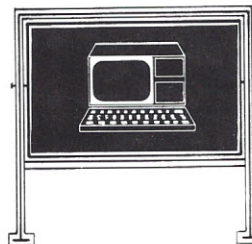
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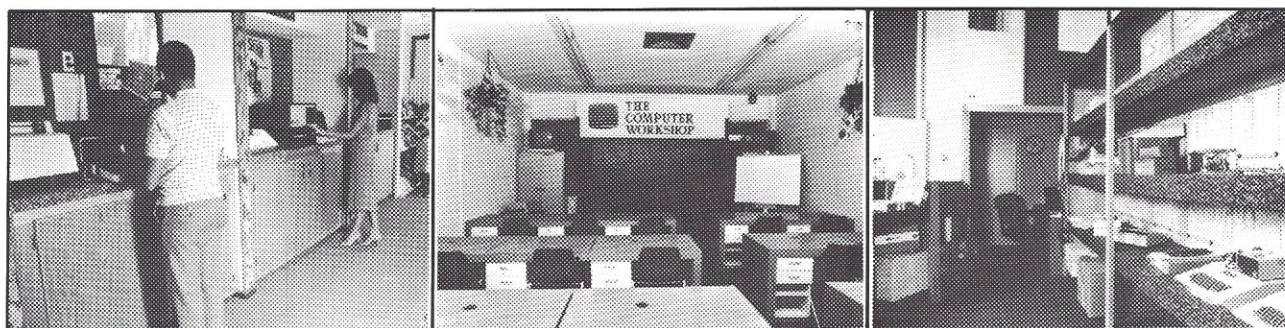




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This terrific assembly-language program is a lookalike for the tremendously popular video arcade game with a similar name. You'll be amazed at the number of hours you can waste trying to master these monsters! Use the arrow keys to change direction, and listen closely for the three warning beeps that tell you when the frightened monsters are about to turn frightening again...

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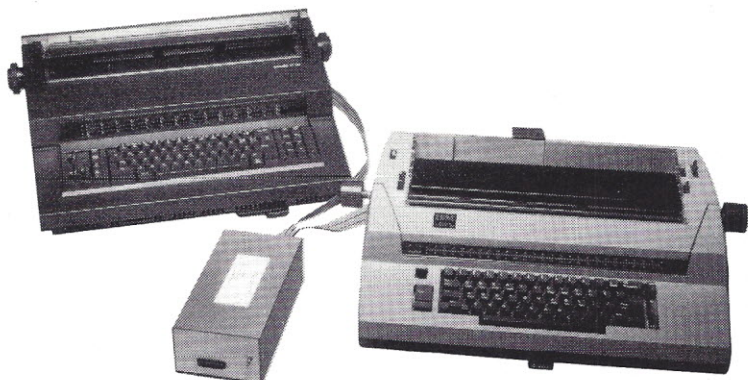
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# The Osborne modem

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Michael McCarthy

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In this issue of *The Portable Companion* staffer Brad Baldwin signs on to THE SOURCE and Dow Jones News/Retrieval Service to show you what these two popular national networks can do for you as a business person, writer, researcher or computer novice.

In a separate article, Thom Hogan checks out the burgeoning world of the so-called "electronic bulletin board," where "something for everyone" is more than just a slogan.

Also in this issue (see **Sources**) is a beginner's list of a few of the more than 500 regional bulletin boards and national databases, to get you started in the fascinating and expanding field of telecommunications.

Let's take a look inside the electric-blue COMM-PAC box and see what you get for \$265.

FIRST, there's the hardware.

The COMM-PAC modem is a slim package that slides neatly into your Osborne's left-hand diskette storage slot (see photo). It doesn't get in the way when you close up the Osborne; so once installed you need never take it out. A small cable plugs into the modem port right beneath the diskette pocket.

Just take the telephone jack plug out of your telephone



set, and plug the jack into the modem. Your Ozzie is now ready to connect up by telephone with hundreds of bulletin boards and tens of thousands of other computers across the country.

Because the modem connects directly through the telephone jack, there's no need to fool around with acoustic coupler earmuffs (which don't work with the modern "thinline" telephones anyway). It also prevents data loss due to external noise, which is more difficult to guard against with acoustic couplers.

And of course the COMM-PAC modem takes up no additional room on your desk.

SECOND, there's the software, which also comes with the COMM-PAC.

AMCALL is the name of the software, designed by MicroCall Services. AMCALL, which sells separately for \$125.00, is easy to use and very powerful. It can interface with almost every kind of communications protocol you are likely to run into. As it comes out of the package, the software is preset for the same popular protocol used by THE SOURCE, Dow Jones and many other national information networks, as well as most local electronic bulletin boards.

That means to hook up with Dow Jones's latest stock prices or to get THE SOURCE's airline reservation service, all you have to do is:

- a. plug the telephone cord into the modem;
- b. load the AMCALL software
- c. press the RETURN key for the menu;
- d. select originate mode from the menu;

- e. Choose the Dow Jones or THE SOURCE phone number from your menu by pressing one key;
- f. The Modem dials the number for you. If the number is busy, AMCALL lets you know.
- g. Presto. You are online. Now all you need do is try to remember your password.

Of course you have to sign up with THE SOURCE or Dow Jones first, which brings us to:

THIRD: By special arrangement, Osborne brings you a nice little bonus: THE SOURCE will waive their \$100 subscription fee, and give you one free hour of prime time usage. And Dow Jones will also give you two free prime time hours, and postpone the subscription fee for a month so you can see how you like the system in action.

The three free hours together with THE SOURCE's sign-on fee waiver, means you save half the \$265 cost of COMM-PAC in your first month of ownership.

The flexibility and power of AMCALL allows Osborne modem owners to choose from a list of alternate protocols and interfaces. That makes COMM-PAC much more flexible than most modem systems.

You can store onto diskette the information that comes in over the wires, to review at your convenience or (in the case of public domain software) use. The storage system for COMM-PAC is much more convenient than on many modems because it lets you dump successive buffers of the same data all in the same file. Other modem systems put each buffer into a separate file, which you later have to string together.





**BUT WHY** would you want a modem for your Osborne, anyway?

Because of what your new communications ability will do for you.

First and foremost, there is information. **THE SOURCE** will give you access to the UPI wire service. Doing articles or research on a current topic? You may not have realized it, but the wire service stories you see in your newspaper are edited for length—sometimes heavily. Through **THE SOURCE** you get the original uncut story, which may be many times longer. You also get all the UPI stories that never make it into the newspaper.

Wonderful! More information on more subjects! But wait a minute—suppose your problem is not getting **MORE** information, but getting **LESS** information. If only there was a way to get only the news that's important to *you*.

Ah, but you can! Build your own customized newspaper by calling for UPI stories by keyword, on topics or references you provide. That means you read only what is of interest to you—but in far more depth.

The following story on databases by Brad Baldwin explains more about **THE SOURCE**'s offerings and what a typical session with **THE SOURCE** looks like. It also details how to get the Dow Jones stock prices—in fact, prices on all the major exchanges, with only the 15 minute statutory delay. Dow Jones also offers a daily summary of the Wall Street Journal transcripts of the Popular \$ Wall Street Week TV show, and lots of other financial services such as historical stock prices and company profiles.

Consumer databases such as **THE SOURCE**, Compu-Serve and NewsNet offer exotic services such as electronic magazines—both electronic versions of newsstand magazines, and special magazines that can only be received by modem. (You could actually become the publisher of your own electronic newspaper, and get royalties!).

Then there's electronic mail. Services like **THE SOURCE** allow you to transfer your electronic files into their computers, then send them to another end-user who uses the same database.

Western Union's database service takes this one step further, offering **EASYLINK**, a service that lets users send messages via the **COMM-PAC** modem to Western Union, which then forwards the message by way of International Telex or national TWX lines. That means you can send a message at any time, anywhere in the world, directly to anyone who owns a Telex machine.

For a businessman whose Telex traffic is fairly light, this might save a lot of money over the alternative of buying a separate Telex machine. It might also save on the noise that paper-terminal Telexes emit, as well as the



time and expense of training a special Telex operator. Or, if you don't know anyone with a Telex machine, **EASYLINK** allows you to send mailgrams directly from your Osborne.

We heard of one businessman in Texas who found an imaginative way to use these electronic mail services.

He travels frequently to field offices in Seattle and Chicago. Each office boasts its own computer and modem. Before departing Texas, he prepares his notes and reports on his Osborne, loads the information into **THE SOURCE**, then goes to Seattle and retrieves the information.

This saves him the trouble of carrying along diskettes and risking data loss. His secretary is able to add updated information without having to keep track of his whereabouts, since the businessman just taps into **THE SOURCE** when he needs it.

That's just one example of the possibilities inherent in the world of telecommunications. A world which you can join with your Ozzie and your **COMM-PAC**.

*For a limited time—November 1 to December 24—Osborne's versatile Personal Pearl software package will be included free with every purchase of **COMM-PAC**. See your authorized Osborne dealer for details.*

*(Mike McCarthy is a technical writer/editor with Osborne Computer Corporation.)*

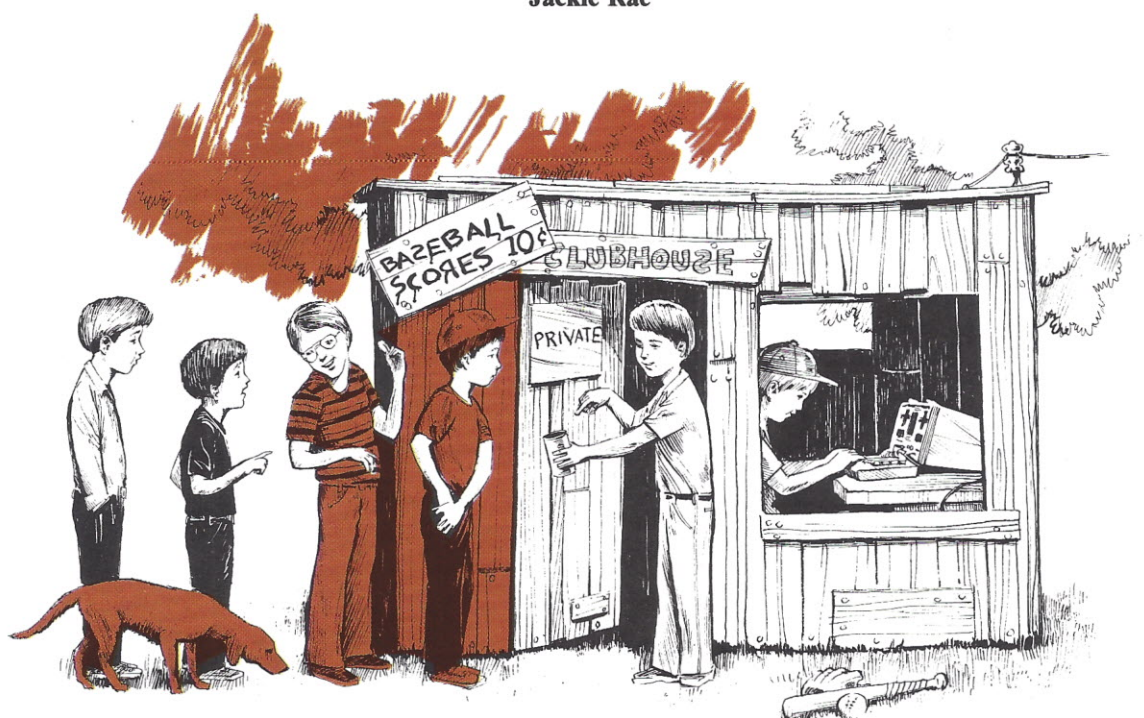
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# Information networks

*A sign of the times*

Brad Baldwin  
Jackie Rae



From the moment that Alexander Graham Bell muttered "Come here Watson, I need you," and was astonished to find he had been heard through his new invention, the telephone, communication has been a consuming interest of humankind. The availability of modems and affordable microcomputers has created a bridge between the tin cans and string of our childhood and the amazing potential of telecommunications. Now Everyman can talk to anyone about virtually anything, anywhere in the world. Pretty heady stuff.

The ramifications of this sudden burst of interest in telecommunications are innumerable and vastly exciting. Just as the advent of television profoundly affected middle class America, the increase in the use of telecommunications forces each of us to reevaluate the way we communicate and receive information in our work and at home. Suddenly Marshall McLuhan's pronouncement that "the medium is the message" has new implications for Everyman (Everyperson?). The "Global Village" is even further compacted.

In the not-so-futureworld, a typical scenario will go something like this. Mom and Pop begin each day by surveying the morning paper from a monitor screen. At the office, Mom zips off the final draft of a big report to the Seattle branch office and directs her secretary to make airline reservations for an upcoming business trip through THE SOURCE. Across town, Dad plugs into the Dow Jones News/Retrieval Service for updates on his client's stock portfolios.

Meanwhile, after school, Junior rings up THE SOURCE for the latest baseball statistics. Later, his sister leaves a message on a favorite bulletin board for anyone who has information on a dreaded school project and Junior advertises his bicycle for sale on the same bulletin board. After dinner, Mom and Pop scan the THE SOURCE for new job listings in Alaska, hoping to relocate the entire family.

Our futureworld is ripe with possibilities and requires a relatively miniscule investment in time and money (if you don't count rising phone bills) to bring to reality. As a



matter of fact, Dow Jones News/Retrieval Service and THE SOURCE are extending special introductory offers to new owners of the Osborne COMM-PAC (modem). Dow Jones News/Retrieval Service delays for 30 days the \$50 start-up fee, and provides two free hours of usage time to investigate the many information services they offer. THE SOURCE waives the \$100 start-up fee and provides one hour of free usage time (to be used within the first two months after purchase).

### So What Does This Mean to You?

Dow Jones News/Retrieval Service is part of the Dow Jones & Company organization, a leader in business journalism. They are publishers of The Wall Street Journal, Barron's National Business and Financial Weekly, and the Dow Jones News Service.

News/Retrieval is an interactive information service accessed through the Osborne computer, a modem and the phone lines. They offer comprehensive and reliable coverage of business and financial news as well as general news and information. Here is a partial list of some of the many services that are provided:

- **The Wall Street Journal Highlights Online.** Includes major news headlines and summaries of the Wall Street Journal's front and back page stories, descriptions of major editorials, and easy to understand market summaries.

- **Dow Jones Quotes.** Provides current information (minimum 15 minimum delay required by law) on stocks, options, bonds, and mutual funds from the New York, American, Midwest and Pacific Stock Exchanges. The service also provides a "historical" perspective of any common or preferred stock. Daily summaries go back 24 days, while monthly summaries are available as far back as 1979.

- **Academic American Encyclopedia.** The entire 20 volume Academic American Encyclopedia contains more than 28,000 current articles and is updated twice a year.

- **Free Test Search.** Includes over 150,000 articles from the various Dow Jones publications. You can search through the backlog using any combination of words, dates or numbers, as far back as June 1979.

- **Media General Financial Services.** Provides easy access to detailed corporate financial data on approximately 3,200 companies and 170 industries.

Additional services offered by Dow Jones include *The Sports Report*, *The Weather Report* and *Cineman Movie Reviews*.

Figure 1 shows what a sample dialog with Dow Jones looks like.

After logging onto their system, you keyboard in the command: //CQ, which accesses the current day's quotes. You are queried as to which stocks you wish to

view and respond with five different "symbols" representing the particular stock you want to review: **YBS DEX EAF IRDV TL** (These abbreviations are located in the Dow Jones Directory).

The following is an example of the stock information provided:

DOW JONES STOCK QUOTE REPORTER SERVICE  
STOCK QUOTES DELAYED OVER 15 MINUTES  
\* = CLOSE PRICE ADJUSTED FOR EX-DIVIDEND

STOCK	BID CLOSE	ASKED OPEN	HIGH	LOW	LAST	VOL(100's)
YBS	12	14				
DEX	28 5/8	28 1/2	28 1/2	28 1/2	28 1/2	14
EAF	11 1/4	11 1/8	11 1/4	10 7/8	10 7/8	352
IRDV	4 1/4	4 3/4				
TL	35 3 1/4	35 1 1/2	35 5/8	35 1/2	35 1/2	98

Dow Jones also boasts an historical quote file, which enables you to view how a stock fares over a period of time. The print-out is orderly and easy to read:

DATE	HIGH	LOW	CLOSE	VOL(100/S)
09/14/82	73 7/8	72 3/8	72 1/2	10189
09/15/82	73 5/8	72 1/2	73 1/2	7629
09/16/82	75	73 3/8	74 1/8	11966
09/17/82	74 3/4	73 7/8	74 1/4	5837
09/20/82	74 3/4	73 3/8	74 5/8	6523
09/21/82	76 3/8	74 3/4	76 3/8	11566
09/22/82	77 5/8	75 5/8	75 3/4	12164
09/23/82	76 5/8	75 1/4	76 3/8	9833
09/24/82	76 1/2	75 5/8	75 1/8	6301
09/27/82	76 7/8	75 3/4	76 3/4	4025
09/28/82	77 1/4	76 1/4	76 1/4	6913
09/29/82	76 3/8	74 1/2	74 3/4	7123

Using the News/Retrieval Sports Report is just as easy. Call up the baseball statistics menu and you'll see this:

BASEBALL STATISTICS	
PRESS	FOR
	—NATIONAL LEAGUE—
1	SCORES AND SCHEDULE
2	STANDINGS
3	LINESCORES
4	BATTNG, PITCHING LEADERS
	—AMERICAN LEAGUE—
5	SCORES AND SCHEDULE
6	STANDINGS
7	LINESCORES
8	BATTING, PITCHING LEADERS



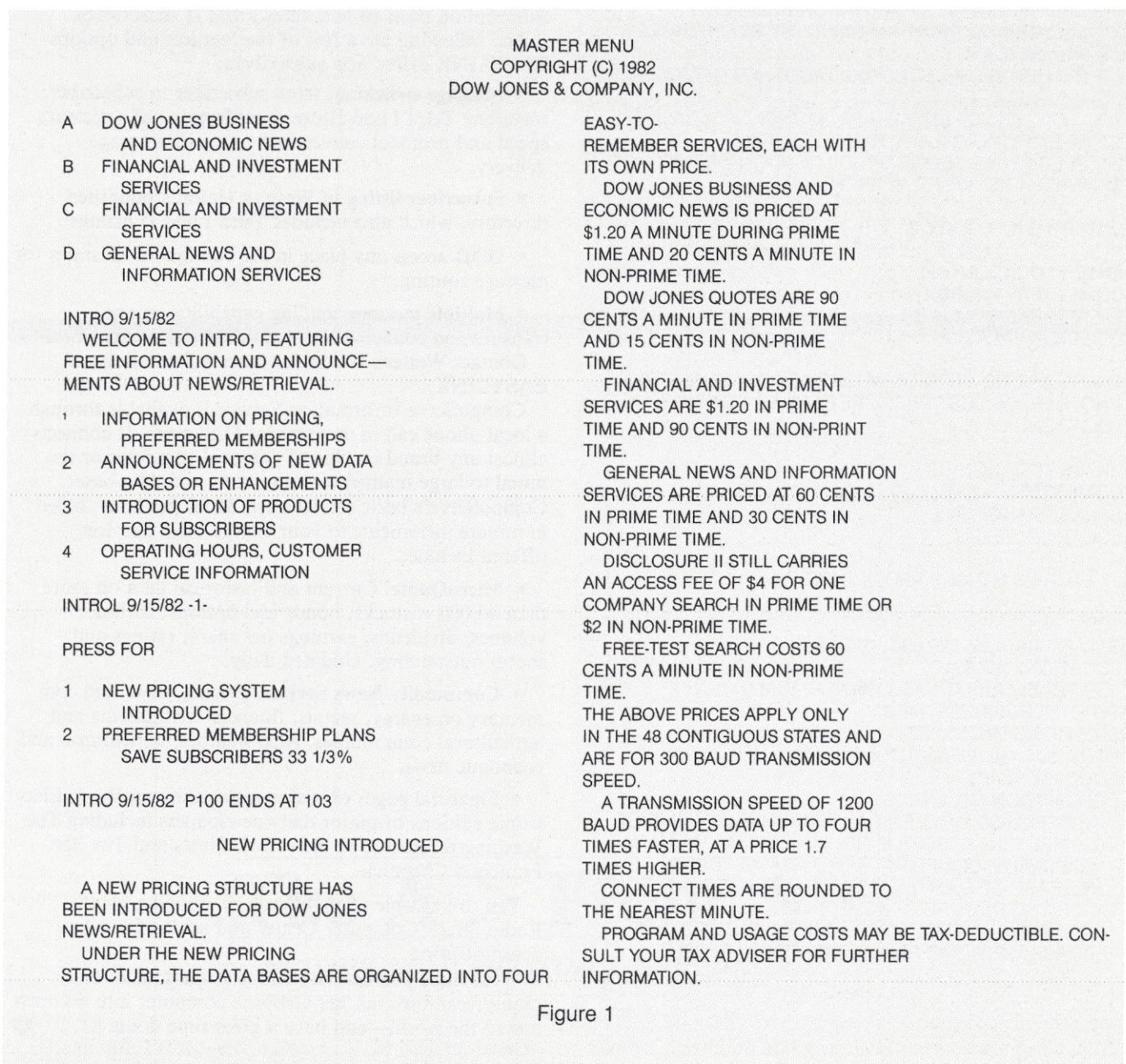
THE SOURCE is another valuable information network for business and home use from Reader's Digest Association (established in June of 1979). Services offered include an Electronic Travel Service, Electronic Mail/Message system, Job Search services, Consumer Aids, Electronic Games, Educational Programs, access to UPI news, and CHAT, a feature that allows typewritten conversation with another subscriber.

The Job Search ability of THE SOURCE is one of its highlights and provides an excellent example of the

potential of information networks for the adventurous user. You can look for a position by:

- 1) Geographic location
- 2) Salary
- 3) Job type
- 4) Keyword search

We searched for positions in the field of computers, with openings in Alaska (AK) and Texas (TX). Figure 2 represents what we came up with during a sample session with THE SOURCE.





— EMPLOY JOBS COMP

THE COMPUTERS CATEGORY CURRENTLY HAS 158 JOBS.

AT THIS POINT, YOU MAY

- 1 - PRINT THESE ENTRIES,
- 2 - SELECT FURTHER FROM THIS DATA BASE BY SPECIFYING GEOGRAPHIC LOCATION, SALARY RANGE DESIRED, OR WITH A KEYWORD SEARCH,
- 3 - LOCATE AND PRINT AN ENTRY BY REFERENCE NUMBER, OR
- 4 - RETURN TO SELECTION OF ANOTHER CATEGORY.

YOU MAY SELECT ENTRIES FROM THIS DATA BASE BY

- 1 - SPECIFYING SALARY RANGE DESIRED
- 2 - SPECIFYING GEOGRAPHIC LOCATION DESIRED, OR
- 3 - WITH A KEYWORD SEARCH

ENTER 1-3 (OR QUIT): 2

ENTER LOCATION: AK  
COMPUTERS - JOBS  
SALARY RANGE: ALL  
LOCATION: ALASKA

THERE ARE NO ENTRIES WITH THIS LOCATION - TRY ANOTHER, OR JUST PRESS RETURN TO CONSIDER ALL LOCATIONS.

ENTER LOCATION: TX  
COMPUTERS - JOBS  
SALARY RANGE: ALL  
LOCATION: TEXAS

17 ENTRIES SATISFY ABOVE CRITERIA

JOB 1 of 17  
SALARY RANGE: \$20,000 - \$29,000  
LOCATION: TEXAS  
JOB TITLE: QUALITY ASSURANCE ADM.  
TYPE OF BUSINESS: MFG  
SIZE OF BUSINESS: BIG  
PRODUCT: OIL FIELD TOOLS  
EDUCATION: BS  
DESCRIPTION OF JOB:  
SUPERVISOR OF CLERICAL PERSONNEL: MAINT. OF  
COMPUTER/MICROFILMING: SUPERV. OF MAINT. OF  
SOFTWARE, COMPUTER APPLICATIONS: BATCH  
RELEASE OF DATA TO MAIN FRAME: USER INTERFACE.  
EXPERIENCE DESIRED - COMMENTS:  
MIN. OF 1 YEAR COBOL PROGRAMMING: CO. WILL  
PURCHASE HOME FOR OUT-OF-TOWN PEOPLE.

FIGURE 2

In addition to THE SOURCE and Dow Jones News/Retrieval Service, there are a number of other information networks operating or springing up across the country.

EASYLINK is a new store-and-forward message switching service of Western Union accessible from any asynchronous 300 or 1200 baud modem. EASYLINK gives the microcomputer owner the ability to communicate via TWX and Telex lines around the world, without having to purchase additional telex equipment or train special operators. EASYLINK is offered on a subscription basis to non-Telex I and II subscribers.

The following are a few of the features and options EASYLINK offers new subscribers:

- **Message switching**, from subscriber to subscriber, including Telex I and II users, performing all necessary speed and protocol conversions to insure message delivery.
- **Subscriber listing** in Western Union's published directory, which also includes Telex I and II listings.
- **DDD access** any place in the contiguous 48 states for message routing.


- **Multiple message** sending capability on one transmission connection as required by the subscriber.

Contact Western Union for more information on EASYLINK.

CompuServe Information Service is available through a local phone call in most major U.S. cities. It connects almost any brand or type of personal computer or terminal to large mainframe computers and data bases. CompuServe's basic service costs \$5.00 per hour, billed in minute increments to your charge card. Services offered include:

- **MicroQuote.** Current and historical data on more than 40,000+ stocks, bonds and options. Includes volumes, dividends, earnings per share, ratings and shares outstanding. Updated daily.
- **Commodity News Service.** Pricing, news and commentary on energy, metals, financial instruments and agricultural commodities. Also weather, agricultural and economic news.
- **Financial pages of major regional newspapers.** Electronic editions of major daily newspapers including The Washington Post, The New York Times and The San Francisco Chronicle.

You can sample CompuServe by stopping by any Radio Shack Computer Center and asking for a free demonstration.

Well, there you have it. The telecommunication's pioneer can turn his/her Osborne computer into an open line to the world—and have a great time doing it! 



# The A > From Afar

## *Playing with electronic bulletin boards*

Thom Hogan

The month I discovered remote CP/M bulletin boards my phone bill tripled. My computer hogged the phone most evenings calling such exotic sounding places as Simi Valley and Calamity Cliffs.

I'm usually easily fascinated, but my sudden love affair with the AT&T long lines went further—here was something useful in addition to being interesting.

So what was it that captured my interest? What hidden treasure came to me via the efforts of Alexander Bell and descendants? Was I suddenly a member of some secret club?

No, friends, the answers are not as strange as you might think. A remote CP/M bulletin board system is simply a computer running CP/M that answers the telephone and allows remote users to utilize the computer while connected via phone lines.

Most of the microcomputer bulletin boards (there are ones for Apple, TRS-80, and other computers as well as the more generalized CP/M ones) trace their history back to Chicago, where two CP/M wizards, Ward Christensen and Randy Suess, wrote a program they called CBBS (Computer Bulletin Board Service).

CBBS allows users to call the remote computer with their own, then leave or read messages. CBBS's became extremely popular with user groups, and indeed, Christensen authored a great number of public domain programs for the CP/M User Group during the past several years.

Messages, huh? Why not just use the phone to call

another person up and give them the message personally? Why not use the mail service, as slow as it sometimes is?

Computerized bulletin boards act as something akin to a network. One computer serves as a "nerve center," where all messages are stored and retrieved at the users' discretion. You may be trying to sell something, need information about a specific product or service, or just be browsing around for someone to chat with. The reason isn't important, it's the informality and individuality that make computerized bulletin boards so fascinating.

There are bulletin boards dedicated to one particular computer, such as the Osborne; some feature news and movie reviews; some are dedicated to subjects; some are oriented towards specific sexual preferences. The simple fact is that there exists several hundred computerized bulletin boards across the country.

Newcomers to computers often find bulletin boards useful to get questions answered relatively quickly and in a manner they can understand. Sometimes these pseudo-conversations go on for weeks. A novice might leave a question on the system about how to hook up printer X to computer Y. A veteran user might make a quick response, abbreviating the details. The novice might read that, then leave another query, this time for details on one aspect of the hookup. Yet another user might respond. And on it can go. The patient user who frequents the bulletin boards in time can get all their questions answered.

So what, you say?



Well, chatting and exchanging information is interesting, but at long distance rates, it just might not be worth it. A good book or a stop by the local dealer or user group might just as effectively answer the question.

### Uploading Experience

That's where another trait of most CP/M bulletin boards comes in. Almost all the CP/M-based CBBS systems feature the ability to upload and download programs. Upload and download? What are we doing, moving into a fourth floor apartment?

The term upload comes from the mainframe (large) computer environment—those giant IBM's and CDC systems that keep track of our phone bills, for instance. To upload something to the computer means to transfer it to the computer. To download means to transfer it from the computer. If you use the same meanings when referring to your own Osborne 1 computer, you'll understand the terms and how they affect you.

There exist over a 100 Osborne diskettes worth of public domain software; everything from games, to languages, to utility programs, to business software.

What I'm hinting at is that you can transfer programs between remote CP/M bulletin board systems and our own. A bulletin board system that allows transfer in and out of files and information is usually referred to as a RCPM (Remote CP/M system), since you get the A> prompt from the remote system and are allowed to do just about anything on that system that you can do with CP/M.

In the CP/M world a public domain program called MODEM (and its complement, XMODEM) is available. The FOG (First Osborne Group) library has this program, although it usually has the name MODEM7.COM or MODOS7.COM. This program has all the features necessary to transfer programs to your Osborne. The basic scenario goes something like this:

1. Using an Osborne 1 with a modem and MODEM7, you call the remote system; MODEM should be in the terminal mode at the beginning of the session.
2. When the remote system answers, press carriage return two or three times.
3. Answer the question about nulls with a 0 (zero).
4. Read the information the system presents to you, and if necessary, type the command that takes you to the CP/M prompt (usually, but not always G).
5. In CP/M find the location of the file you wish to receive (i.e., use the DIR command to examine the drives).
6. When you've found the file, type:  
XMODEM d:filename.typ
7. The system tells you how long the file you've selected is and how long it takes to transfer at 300 baud (the most common communications speed).
8. Get back to the MODEM7 menu and use the R (receive) command to receive the file on a blank diskette in drive B.
9. Monitor the progress of the transfer by watching the messages displayed on your screen. You should see a message indicating transfer is proceeding; sometimes, especially over noisy telephone lines, you'll see some error messages. Fortunately, MODEM7 and XMODEM know how to correct errors and retry until your system gets the right data.

Okay, now you know how to do it, what kind of programs can you expect to find and transfer?

First, the bad news: no reputable bulletin board (i.e. one that is going to be around for very long) EVER knowingly allows copyrighted material to be transferred from it to you. Thus, don't expect to be able to get the latest Osborne Approved Software program while connected to a remote bulletin board system.

Now, the good news: there exist over a 100 Osborne diskettes worth of public domain software; everything from games, to languages, to utility programs, to business software. All of this software is copiable and free (except for the phone bill—don't forget that Ma Bell will extract her dues while you're on a remote system or you may get carried away).

Personally, I found the utility programs available from the public domain to be the most useful ones for me. For instance, I replaced the DIR command on my CP/M with a special XDIR program; I replaced ERA with ERAQ, a program that queries me before erasing; I replaced TYPE with READ (sometimes found under the new SHOW or MLIST), a program that lists only 24 lines of material at a time—i.e., it doesn't allow material to zoom off the screen before I've read it; and I've replaced PIP with WASH, a menu-driven program that performs similar functions, but goes much further than PIP and the CP/M command set.



## Squeezing Files

While I'm on the subject of file transfers, I should tell you about "squeezing" and "unsqueezing" of files.

Transferring long assembly language or text files at 300 baud can be quite time-consuming. I've transferred files that took over 30 minutes to receive! As you might expect, users got a little impatient with slow transfers. Eventually, one such user developed a public domain set of programs that takes normal text files and squashes them by anywhere from 15 to 45 percent. The program that does this was originally called SQUEEZE.COM, but you might find it under a different, more cryptic, name that reflects the many revisions it has gone through.

When you run SQUEEZE on a text file, it creates an exact duplicate of the file, compressed as much as possible, with the same file name *except* for a "Q" as the second letter of the file type. Thus, if you SQUEEZE the file THOMS.TXT, you end up with a shorter file called THOMS.TQT. If you're looking around the bulletin board system and are wondering where all the q's came from, those are just files that have been squeezed (squozen?).

Obviously, a file that has been compressed using SQUEEZE must be restored to its original state before being used. The program to do this is UNSQUEEZE (also found under other names, so browse the directory for programs with SQ in their name). Remember, the SQUEEZE/UNSQUEEZE utility is primarily used to reduce the amount of time it takes to transfer a file—most RCPMs have compressed all their files except for UNSQUEEZE.ASM, which you'll need to get started.

Speaking of getting started, let me describe to you how you're going to have to go about things to use files that have that telltale Q in the middle of their file type:

1. Log onto an RCPM that has UNSQUEEZE.ASM or one of its sequels.
2. Use MODEM7 and XMODEM (or the Osborne modem's AMCALL in the CP/M-user group protocol) to transfer UNSQUEEZE.ASM and the documentation that accompanies it to your computer. Sometimes you can skip this step if the RCPM happens to have an already assembled version of UNSQUEEZE (normally called UNSQUEEZE.OBJ) that you can transfer.
3. Use ASM.COM on your Osborne to assemble UNSQUEEZE, then use LOAD to create an executable file. If you received UNSQUEEZE.OBJ, just rename it to UNSQUEEZE.COM.
4. Transfer other files, as you desire.
5. Use your new copy of UNSQUEEZE.COM to uncompress them.

If you are going to be sending files to the RCPM, you'll

need to make sure that SQUEEZE is one of the first programs you receive, so that you can first compress your files before sending them. Remember, you're probably calling long-distance, so anything you can do to save connect time helps keep costs down.


## Some Rules to Remember

Many RCPMs exist. There are even a few already that are dedicated to Osbornes (**refer to Sources**).

Most RCPMs are operated by a computer owner who does it for fun; there is no charge (other than what Ma Bell collects on her tollway) for using them. It is only fair that you use some common sense etiquette while using an RCPM:

1. Stay on the shortest amount of time possible. No one wants to deny you the time it takes to do what it is you want to do while connected to the RCPM, but don't go out for a cup of coffee while in the middle of a session. Remember, others are interested in using the system, too.
2. Leave everything as you found it. Don't try to "crash" the system, move files around, leave garbage or other nonsense files, and so on. Most RCPMs are pretty secure in that they will not allow you to perform catastrophic acts, but even the best-protected system can be broken.
3. Leave in an orderly fashion. Normal method of leaving is to type the word BYE when you see the CP/M prompt. This allows the system to be turned OFF to you in an orderly fashion.
4. When you first use a system, be sure to read any welcoming messages or "overview" files. The time you spend reading them will not be wasted, for they are almost always invaluable in learning the idiosyncracies of the RCPM you're using.
5. If the system is listed as a "callback" system, this means that you should call the number, let it ring ONCE, hangup, and call again within 40 seconds. The reason this is done is because the phone at the other end is used both for the modem and for people. If the phone rings once then rings within 40 seconds, the computer answers; if the phone rings more than once, a human answers.

Even with all this, I still haven't covered but a portion of what's available using remote bulletin board systems. The Sources section in this issue gives a short list of major RCPMs of interest to Osborne owners (most RCPMs have lists of other systems that you can read or capture).

You've got no excuse now. Hook up that modem, get a copy of the FOG MODEM7 program, dial one of the numbers listed and have at it. 



# On a clear day you can see Siberia

Meredith Lind

Recently, two Alaskan businesses, an engineering firm (Fryer/Pressley Engineering) and a project management firm (JEVAD, Inc.), cooperated in a facility survey of school buildings in Eskimo villages throughout northwest Alaska. The Bering Strait School District covers approximately 80,000 square miles along the United States—Soviet border, and some villages are so close to Russia that on a clear day you can see Siberia.

In this area the beaches are still snow-covered during June and July, power is generally provided by small diesel generator sets, and communications are conducted over a single village phone through earth station-satellite links. Primary access to most villages is by small charter plane on dirt runways, while ground transportation within villages is by three-wheel all-terrain vehicle or snow machine.

Two teams of electrical and mechanical engineers equipped with Osbornes, printers and modems spent four weeks in 14 villages surveying bush schools and identifying major maintenance deficiencies as well as fire, safety and building code violations. Using the Osbornes to process data gathered, they generated work orders and recommendations for the school district. The Osborne was selected for use in this project for several reasons. Jim Pressley, Chief of Production for Fryer/Pressley Engineering, stated, "We were suitably impressed with the versatility of the software, coupled with the power of the machine. Once the field work became a reality, portability determined the selection of Osbornes."

Using dBASE II programming, a data base was established consisting of each school's major mechanical items and the associated parts for later transfer to hard disk, in order to make the logistics of maintenance within the school district more efficient. Data was also collected describing future changes required to conform with the provisions of new building codes. This data was compiled in the form of work orders, and approximately 50 K bytes of data were stored per village.

This programming method required considerable disk manipulation causing the disk drives to run almost constantly. The team members were impressed that the Osborne disk drives held up so well under steady use over the course of the project. They reported that not once was there a glitch in disk I/O operations. Although program development took place in the office, team members found the program was easily modified to meet unforeseen contingencies in the field.

It had originally been planned to transfer some of the information using the modems during the data collection phase. However, most of the villages had only one phone on which a five minute limit-per-call is set. In the three schools which had separate phones, communication links were disrupted or disconnected every few minutes. So instead copies of data diskettes were sent to the Fryer/Pressley resident project manager, Roy Barkwell, in Nome, Alaska. Surge protectors were used, and although most of the electrical systems encountered were highly er-

ratic, only one major failure occurred when a voltage spike smoked a monitor coil and transformed the disk drives into variable speed devices.

The majority of the problems had more to do with the region's unpredictable weather and its affect on flying conditions. JEVAD team member Craig E. Mills remarked, "The Osbornes were easy to get around, and once set up, they were as easy to use as in the office." Airport security proved to be no problem, partly because only Anchorage and Nome had boarding security control. At these two points, the security personnel were more interested in the small screen and "what channels they could receive." A tourist on one flight asked what kind of sewing machines the teams were taking to sell to the Eskimos. Unfortunately, instead of explaining Osbornes to her, the group launched into a discussion of the merits of computerized sewing machines and the hardships of traveling salesmen in the Alaskan bush. The village Eskimos were unsurprised by the Osbornes, being familiar with the Apple computers used in most bush schools. The most common response was, "Oh, a computer."

The Osbornes took considerable abuse in the course of their travels. Travel by Cessna 207 and three-wheeler were the least of it. In Gambell one machine was actually run over by a three-wheeler while a team member watched the arriving plane instead of where he was going. But after washing off the tire tracks, the computer worked just fine.

The only real catastrophe came when a defective folding table folded up at the wrong time and sent an operating Osborne crashing to the floor. The computer was returned to the project base in Nome, where team member Henry Kallenberg, an electrical engineer who has extensive experience with computers, dismantled and repaired the Osborne. He used spare parts from a broken cassette recorder bought hurriedly at a garage sale and soldered them with a screw driver heated over a camp stove. This Osborne survived to turn out many more work orders and to be saved one last time upon return to Anchorage. There an airport skycap swung the baggage cart in a sharp turn sending the Osborne flying. Craig Mills rescued it with a spectacular mid-air grab, preventing the need for any further repairs.

The Osborne's ease-of-use encouraged the field crews to finish work ahead of schedule. Using Osbornes in the field also eliminated most of the data shuffling and coordination associated with such projects and provided on-the-spot work orders, reducing the time delay in starting repair work by at least six weeks. The use of computers on this project resulted in owner savings of approximately twenty-five percent (25%) of the total project. Portable computers are already proving their worth in field based operations, and even the exigencies of the Alaskan bush were ameliorated by the use of Osbornes.

*(Meredith Lind is the Publications Editor for Fryer/Pressley Engineering, Inc.)*





## Squeezing Files

While I'm on the subject of file transfers, I should tell you about "squeezing" and "unsqueezing" of files.

Transferring long assembly language or text files at 300 baud can be quite time-consuming. I've transferred files that took over 30 minutes to receive! As you might expect, users got a little impatient with slow transfers. Eventually, one such user developed a public domain set of programs that takes normal text files and squashes them by anywhere from 15 to 45 percent. The program that does this was originally called SQUEEZE.COM, but you might find it under a different, more cryptic, name that reflects the many revisions it has gone through.

When you run SQUEEZE on a text file, it creates an exact duplicate of the file, compressed as much as possible, with the same file name *except* for a "Q" as the second letter of the file type. Thus, if you SQUEEZE the file THOMS.TXT, you end up with a shorter file called THOMS.TQT. If you're looking around the bulletin board system and are wondering where all the q's came from, those are just files that have been squeezed (squozen?).

Obviously, a file that has been compressed using SQUEEZE must be restored to its original state before being used. The program to do this is UNSQUEEZE (also found under other names, so browse the directory for programs with SQ in their name). Remember, the SQUEEZE/UNSQUEEZE utility is primarily used to reduce the amount of time it takes to transfer a file—most RCPMs have compressed all their files except for UNSQUEEZE.ASM, which you'll need to get started.

Speaking of getting started, let me describe to you how you're going to have to go about things to use files that have that telltale Q in the middle of their file type:

1. Log onto an RCPM that has UNSQUEEZE.ASM or one of its sequels.
2. Use MODEM7 and XMODEM (or the Osborne modem's AMCALL in the CP/M-user group protocol) to transfer UNSQUEEZE.ASM and the documentation that accompanies it to your computer. Sometimes you can skip this step if the RCPM happens to have an already assembled version of UNSQUEEZE (normally called UNSQUEEZE.OBJ) that you can transfer.
3. Use ASM.COM on your Osborne to assemble UNSQUEEZE, then use LOAD to create an executable file. If you received UNSQUEEZE.OBJ, just rename it to UNSQUEEZE.COM.
4. Transfer other files, as you desire.
5. Use your new copy of UNSQUEEZE.COM to uncompress them.

If you are going to be sending files to the RCPM, you'll

need to make sure that SQUEEZE is one of the first programs you receive, so that you can first compress your files before sending them. Remember, you're probably calling long-distance, so anything you can do to save connect time helps keep costs down.


## Some Rules to Remember

Many RCPMs exist. There are even a few already that are dedicated to Osbornes (refer to Sources).

Most RCPMs are operated by a computer owner who does it for fun; there is no charge (other than what Ma Bell collects on her tollway) for using them. It is only fair that you use some common sense etiquette while using an RCPM:

1. Stay on the shortest amount of time possible. No one wants to deny you the time it takes to do what it is you want to do while connected to the RCPM, but don't go out for a cup of coffee while in the middle of a session. Remember, others are interested in using the system, too.
2. Leave everything as you found it. Don't try to "crash" the system, move files around, leave garbage or other nonsense files, and so on. Most RCPMs are pretty secure in that they will not allow you to perform catastrophic acts, but even the best-protected system can be broken.
3. Leave in an orderly fashion. Normal method of leaving is to type the word BYE when you see the CP/M prompt. This allows the system to be turned OFF to you in an orderly fashion.
4. When you first use a system, be sure to read any welcoming messages or "overview" files. The time you spend reading them will not be wasted, for they are almost always invaluable in learning the idiosyncracies of the RCPM you're using.
5. If the system is listed as a "callback" system, this means that you should call the number, let it ring ONCE, hangup, and call again within 40 seconds. The reason this is done is because the phone at the other end is used both for the modem and for people. If the phone rings once then rings within 40 seconds, the computer answers; if the phone rings more than once, a human answers.

Even with all this, I still haven't covered but a portion of what's available using remote bulletin board systems. The Sources section in this issue gives a short list of major RCPMs of interest to Osborne owners (most RCPMs have lists of other systems that you can read or capture).

You've got no excuse now. Hook up that modem, get a copy of the FOG MODEM7 program, dial one of the numbers listed and have at it. 



# BASIC screen dump for your Epson printer

Tim Kretschmar

In my work using other computers and in my first efforts on the Osborne I using WordStar and SuperCalc, I became dependent upon the ability to print the contents of a file or the video display at my discretion.

When I began writing my own Microsoft BASIC programs, I discovered that no "built-in" function existed in either the hardware or software that would permit me to selectively generate printouts of my program results with my Epson printer. This was frustrating because there were times when I needed a printout and other times when one wasn't necessary. I didn't want to waste paper by printing the results of every run.

My MBASIC options were to either "PRINT" my results (send them to video display) or to "LPRINT" them (send them to the printer). This either/or choice didn't satisfy my desire for a "sometimes" capability.

After searching through a number of books, consulting local "experts," and telephoning OCC's technical assistance department and Frank Morton, president of FOG, I determined that my problem could be solved through programming.

The "right" way to do it was to write an assembly language subroutine. It would be linked to the video software to send the contents of the video display to the printer when a special function key was depressed. Bad news for a person not familiar with assembly language programming but with an immediate need for a screen dump.

The "easy," workable, considerably less efficient alternative, but the one I chose to satisfy my short-term needs, was to convert a subroutine shown in my Epson MX-80 user's manual to MBASIC. This subroutine PEEK'ed at and then LPRINT'ed the contents of the video memory. A number of changes were required, however, to accommodate the Osborne I's idiosyncrasies.

I initially wrote a program that printed the contents of all 32 lines of video memory (F000 to FFFF hex) and quickly discovered that the first position of the 24-line video display wasn't necessarily the first position of video memory. I found that a "wrap-around" feature was used to construct the video display. The first display line, for example, might be line 25 of video memory. Memory lines 26—32 and 1—16 would be used to construct the remainder of the display. To determine the first line of

memory to print, I found that I could skip over the first eight lines past the cursor and begin printing with the first position of the ninth line.

The screen dump subroutine consists of three sections. The first section (lines 1000—1030) searches through the video memory until the cursor (160 decimal) is located. The second section (lines 1040—1070) counts off the unwanted video memory lines, and the third section (lines 1080—1150) prints the ASCII value of the contents of the video display until the cursor is encountered a second time, thus indicating the end of the video display. The following variables are used in the subroutine:

A = The first position of a line in video memory  
B = The length of a line of video memory  
C = the decimal value of "A" being PEEK'ed at  
D = the line counter for unwanted lines  
E = the first position of a line to be printed  
F = the relative character position on a print line  
G = the particular character to be printed

```
1000 REM ***** SCREEN DUMP SUBROUTINE *****
1010 A = &HF000 : B = 128 : D = 1
1020 C = PEEK(A) : IF C = 160 THEN GOTO 1040
1030 A = A + B : GOTO 1020
1040 A = A + B : D = D + 1
1050 IF A > &HFF80 THEN A = &HF000
1060 IF D > 8 THEN GOTO 1070 ELSE 1040
1070 FOR E = A TO A + 4096 STEP 128 : IF E > &HFF80
    THEN E = &HF000
1080   FOR F = 0 TO 65
1090     G = PEEK(E + F) : IF G = 160 THEN GOTO 1150
1100     IF G < 32 THEN G = G + 64
1110     IF G > 127 AND G < 192 THEN G = G + 32
1120     LPRINT CHR$(15) CHR$(G);
1130   NEXT F
1140 NEXT E
1150 RETURN
```

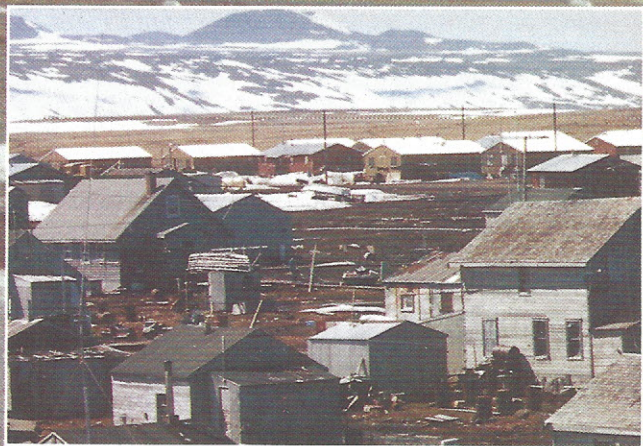
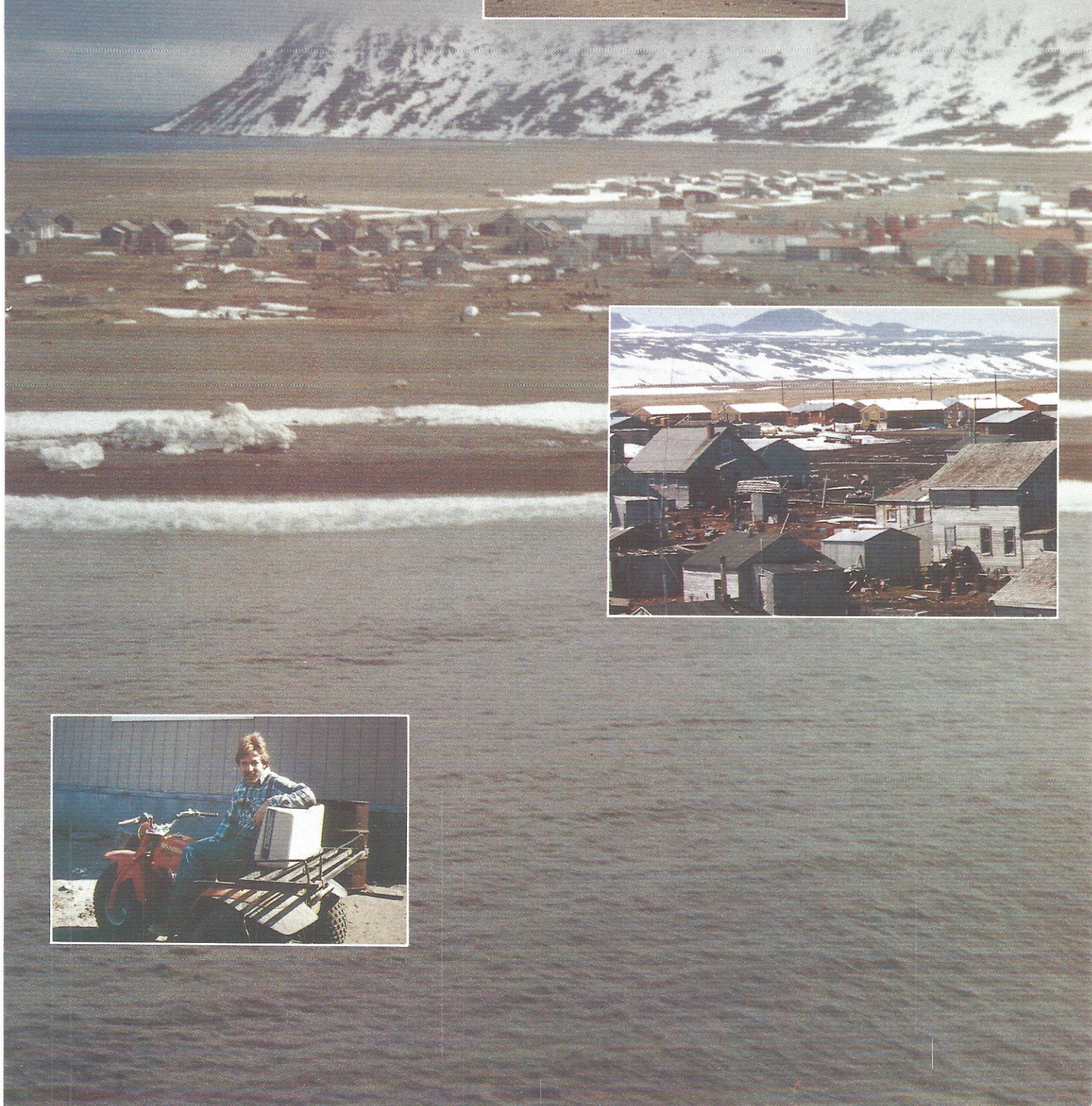
Although it may appear superfluous, don't forget the semi-colon at the end of line 1120 or you'll end up with one character per line. The semi-colon suppresses a line feed until the print line is filled up.

After you've included the subroutine in your programs, you can call it into action by using a "GOSUB" command as shown in the following sequence:

```
100 INPUT "DO YOU WANT A PRINTOUT OF THIS
    (Y/N)"; P$
110 IF P$ = "Y" THEN GOSUB 1000
```

There you have it—a simple and effective means of accomplishing a screen dump on your Osborne I. Now back to the new book I'm reading, "Everything You Wanted To Know About 8080 Assembly Language Programming In 100 Words Or Less." Hmmm, I wonder....



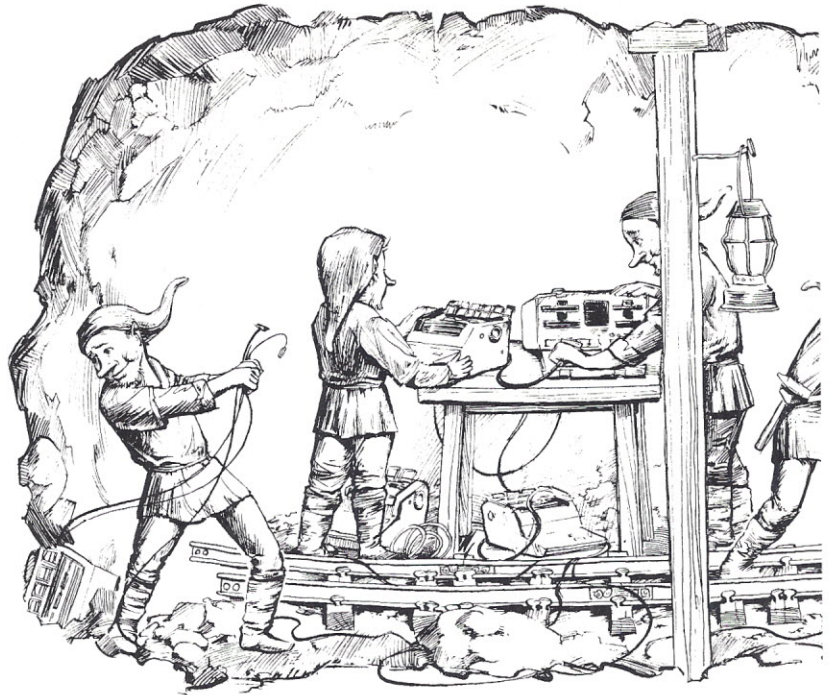




# I/O, I/O It's Off To Work We Go

Brad Baldwin

## Part Two: Parallel Interfaces



*(this is the second in a series of articles on interfacing other devices with the Osborne 1).*

The first question to answer may very well be, "What is a parallel interface?" Simply, it is a method of connecting one device to another using standard components. At Osborne, we use parallel interfacing to hook our computers with hard disk drives, other computers, and printers. The actual interface is the cable and plug that connects to our IEEE-488 port. The term "parallel interfacing" not only refers to those physical components, but also to electrical control signals, logic, and timing diagrams. First, let's begin by reviewing binary coding.

Your WordStar text, SuperCalc spreadsheets, and other files are made up of individual units, called binary bits. A bit, electrically, is either ON or OFF. Encoding information as binary bits makes it easy to transmit over a wire; in parallel transmission the computer sends a positive voltage signal for a "1" bit and uses zero voltage levels for the "0" bits. Universal ASCII (American Standard Code for Information Interchange) coding breaks down each alphabetic, numeric, and control character into its own specific sequence of 1's and 0's. For example, the binary code for "Hello!" is:

Character	7	6	5	4	3	2	1	(Bit #)
H	1	0	0	1	0	0	0	
e	1	1	0	0	1	0	1	
l	1	1	0	1	1	0	0	
l	1	1	0	1	1	0	0	
o	1	1	0	1	1	1	1	
!	0	1	0	0	0	0	1	



# Using The Micro Link

## *Communicating between the Osborne 1 and mainframe computers*

Joey Reagan and Jamie Dinkelacker

One of the major advantages of owning a microcomputer is the ability to access larger mainframes from the convenience of home or office. The two of us find access to mainframes indispensable in our work; each of us needs to perform statistical analyses on large data bases, to store large files, and to use programming languages not available for the Osborne 1. Likewise, the mainframe allows easy communication with our colleagues. The purpose of this article is to share some of the problems—and their solutions—that we have encountered communicating between mainframes and our Osborne 1s.

We each have an Osborne 1, a NEC PC-8023A-C dot matrix printer, an Anderson-Jacobson AJ 1234 MODEM and The Micro Link communications software package (Wordcraft). We use 1200 baud configurations for all communications—with both the mainframe and the peripherals; the MODEM is connected to the RS232 port and the printer is attached to the "IEEE" port on the Osborne 1.

Our communications are used to access the CDC Cyber 750 at Michigan State University (MSU) and the Amdahl 470V/6 (similar to the IBM 360/67 or 370 at the University of Michigan (UM)). In addition, we use the "Merit Network" to communicate between the two mainframes.

Of course, we first performed the necessary setup routines for The Micro Link, although full information on configuring the diskette for use is only contained on a printed insert to The Micro Link manual. If you didn't get one, write to Osborne or contact your dealer. Improper setup can impair communications. Once configured there can be additional problems.

The following is a list of problems we encountered:

1. Bits of data may be lost when writing from the mainframe to the copy buffer. This results in alteration of characters in text, e.g., a space may become a "g." This occurs when screen formatting—or word wrap—(Command 8) is ON. **Solution:** Turn screen formatting OFF. (The problem is noted in the manual only for receiving non-ASCII files.)
2. Data are overwritten on the screen. This is the result of again having left screen formatting ON but turning line feed OFF (Command 7). This condition also occurs if fields greater than that specified in Command 15 are used with both screen formatting and line feed on. **Solution:** Line feed ON; screen formatting OFF.
3. The inability to read to the screen or write to the copy buffer lines longer than 99 columns. e.g., some output is 137 columns wide at the mainframe. Thus, output fields

are truncated and data are lost. **Solution:** None found. **NOTE:** The Micro Link only reads the first two characters of Command 15. Trying 15.110, for example, leads to a field width of 11.

4. A null line is not sent with the <CR>. A double-null is used for example, as the "stop" command for the EDIT mode on the UM system. **Solution:** ^C <CR>.

**NOTE:** This works at UM only. The usefulness of ^C is dependent on the operating commands of the mainframe, and ^C will not abort a program run.

5. <ESC> and ^E are the "Attention" commands for MSU and UM, respectively, allowing one to abort and escape the current run. These are not available a priori on The Micro Link. **Solution:** The Micro Link provides Command 19 to alter the command mode character. Replace with a little-used keyboard character. For example, 19.5C provides a backslash for toggling between terminal and menu modes: <ESC> can then be used for abort purposes.

6. After turning the printer on (command 26), printed results may be overwritten or bytes may be lost; data are lost when printing a stream larger than the printer buffer. **Solution:** none. This seems to be a problem of differences in data send speeds. Follow the suggestions in the manual: write to disc and print later.

We have generally found The Micro Link to be a useful communications package and to serve our purposes quite well with the following menu modifications:

- :7 <CR> (turn OFF line feed)
- :8 <CR> (turn OFF screen formatting/word wrap)
- :15.99 <CR> (set line width to 99 columns)
- :19.5C <CR> (set command mode character to backslash—"\\")

Most solutions involve setting up appropriate formatting when initializing The Micro Link. Other solutions require software modifications or the use of alternative control commands to "get around" the problem. Sometimes it's just playing with commands (like ^C) to see what they will accomplish with the mainframe on which one is working. Also keep in mind that these problems may be different or others may arise with different baud rates or other mainframes. □

*Dr. Reagan is Assistant Professor of Communication at The University of Michigan. Dr. Dinkelacker is President of The Blue Sky Company and is a marketing communications consultant in East Lansing, Michigan.*

*(The Micro Link is licensed from and the trademark of Wordcraft, Inc.)*





becomes HIGH in the following conditions:

- 1) During printing.
- 2) Off-line mode.
- 3) Error mode.
- 4) The data buffer is full.

### Pin 13 SELECT

This is an output signal from the printer that indicates whether the printer is in a SELECT or DESELECT state. The signal is HIGH under SELECT and LOW under DESELECT. The SELECT state occurs when the printer is ready to print while the DESELECT mode occurs when it is not ready to print, which seems simple enough. The latter condition occurs when the printer's "select" switch is OFF, paper is out, or the buffer is full. Those signals are the more important ones used in conjunction with the Osborne 1. Grounds were not included in the description but are none-the-less important, as we shall see later on.

In summary, parallel data transmission specific to the Osborne 1 occurs as follows:

- a) Eight data lines are used.
- b) Data is accepted with a STROBE signal from the Osborne.
- c) The BUSY signal output of the printer is used to indicate the printer status to the Osborne 1. The busy line is HIGH until there is enough room in the buffer for a complete line of characters to be stored (on line printers), at which time it will go LOW. (A

line printer, in this context, is one that waits for a complete line of characters before printing.)

### And It's Off To Work We Go

In the movie TRON, characters talked in a sort of "high-tech" computer dialect. If the Epson MX-80 and the Osborne 1 were connected up and ready to communicate, their conversation might go something like this:

**Eppie:** Well, Ossie, I'm selected and not busy, so if you want to start sending me data, go right ahead (Eppie is a line printer).

**Ossie:** Okay, here it comes... (sends 8 bits or one character)

**Ossie:** Well, I've allowed 1/2 micro second for all the data bits to arrive, so I'll STROBE it in for you.

**Ossie:** Here's another 8 bits...

**Narrator:** Ossie continues to send DATA to Eppie as long as the buffer does not fill up or Ossie sends an end of line character.

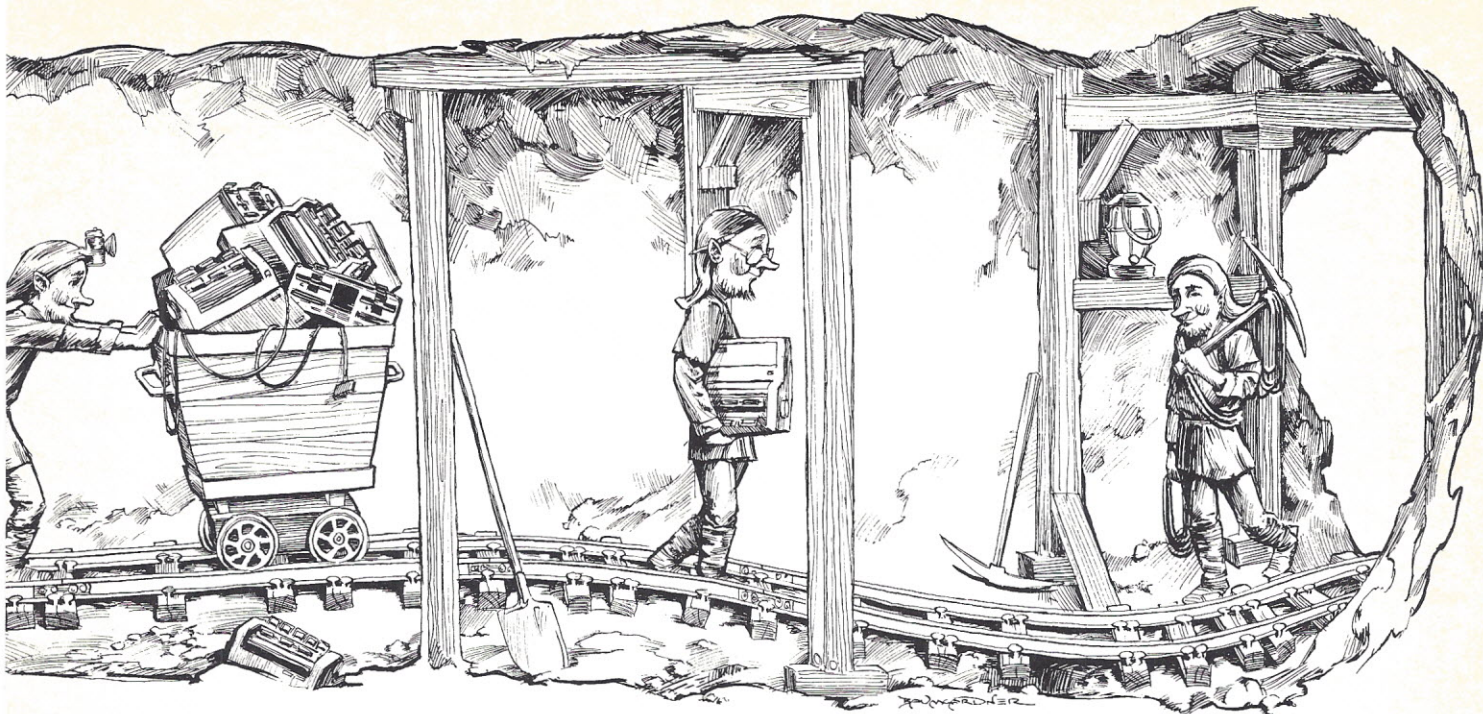
**Eppie:** Okay, I just received an "end of line" character so I'm going BUSY—stop sending me data while I print out my buffer.

rip rip rip rip rip rip... (Epson printing sounds)

**Eppie:** All finished, I'm no longer busy... send me another line of data.

**Narrator:** And the sequence starts again for the next line of print.





(There is actually one more bit known as the high-order bit on the left side of the sequence; however, this bit is ignored except in special circumstances.)

In serial communications or data transfer (as described in the last issue), one bit follows the other down the same pathway, much like a train and its cars moving down a track. In parallel transmission, each individual bit has its own track or pathway to travel on, much like autos on a multi-laned highway. Data bit 1, data bit 2, data bit 3, etc.—they all have their own communications line.

### The Gory Details—Let's Get Technical

Parallel interfacing is more than just transmitting data bits; control signals and proper timing are also required. The "Centronics parallel" interface has five types of signals concern us most:

- |                  |                   |
|------------------|-------------------|
| 1) Data bits (8) | 4) Select         |
| 2) Data Strobe   | 5) Signal Grounds |
| 3) Busy          |                   |

An understanding of the function of these signals is important in understanding the logic behind parallel interfacing. A few of them will be discussed now.

### I/O, I/O...Signal Explanation And Pinouts

Printer manufacturers, for the most part, connect their parallel signals to standard pins, which helps in interfacing the wide range of printers on the market today. (The Osborne configuration program—known as "SETUP"—further facilitates the ease by which parallel printers connect to the Osborne.) Signal names are not completely

standardized, so an understanding of the signal functions is helpful when interfacing new or unknown peripherals.

#### Pin 1 DATA STROBE

This is a synchronizing signal sent from the computer to the printer for reading (Receiving) the data bit signals. The signal is normally HIGH (means positive voltage levels, not a drug induced stupor); data is read when the host computer changes it to LOW. The eight different data bits will not reach the printer at the same time—they may be microseconds apart. They are put into a "holding tank" as they arrive, and when they are all accounted for, the strobe signal allows them to be read in. Most printers require a .5 to 1.0 microsecond pulse to "clock in" this data.

#### pins 2-9 DATA LINES

These are used to transmit ASCII data in a parallel format.

DATA 1	Pin 2	DATA 2	Pin 3
DATA 3	Pin 4	DATA 4	Pin 5
DATA 5	Pin 6	DATA 6	Pin 7
DATA 7	Pin 8	DATA 8	Pin 9

A HIGH level (+5 volts) indicates a binary "1", while a LOW level (OV) indicates a binary "0".

#### Pin 11 BUSY

This signal is sent from the printer; a HIGH level indicates that the printer cannot receive data, while a LOW level indicates that it can receive data. This signal



# LEARNING THE VALUE OF CBASIC

J.R. Henry

I am very, very happy with my Osborne. We average about 5 hours a day together, with both drives pleasantly grinding data and talking back and forth. I've made three important purchases in my lifetime, and I consider the Osborne one of them. In case you're the curious type, the other two were a 1946 Cessna 120 and a 1954 Chevy Bel Air.

I do have a few minor complaints however. I bought the Osborne in order to develop some special application software, and was fairly confident that Microsoft BASIC-80 would suffice. I read through the Osborne *User's Guide* and was sort of surprised to find 4 pages devoted to programming in CBASIC and over 20 pages devoted to programming in MBASIC-80. I searched through both parts of the manual looking for clues on precision. For a while it appeared that values obtained by MBASIC functions could be made double precision by defining them to be. Carefully I searched the manual for an explicit discussion of the precision of the MBASIC functions. I searched in vain. Finally I wrote a dinky program to generate pi and was amazed the  $\pi = 3.141592979431152!$  The program which generated this (incorrect) number was written using the double precision mode for the variables. I must admit, I was a bit annoyed that pi was only accurate to six places. I know pi to 12 places and so do most \$20 pocket calculators. Why would they have the so-called "double precision" capability if their functions are only worth six places? I also soon found that the exponentiation operation is only good for six places. (Presumably because it uses the log function to generate the power.) I found that the MBASIC square root of 1 is 1.41421353816986, when obtained by  $(2 \sim .5)$ . This is incorrect in the eighth place.

So, it turns out that what you get is double precision

as long as you don't do anything but add, subtract, multiply and divide.

By now you're probably wondering who on God's green earth would WANT pi to more than six places anyhow? Surveyors, that's who. State laws require that land surveys have a minimum accuracy. Nowadays surveyors use 01" instruments to measure angles. That's right one second. And depending upon the angle and the function, six place accuracy only represents 60 seconds of angular precision.

Needless to say I was a bit depressed over this dilemma. A (busy) call to the Osborne phones didn't help either. They weren't even sure what I was talking about. As my mind searched for a way out I had a brilliant flash: FORTRAN! Familiar ground! I thought I'd just get a hold of a FORTRAN compiler and my precision problems will be gone. Another call to the Osborne phones left me feeling even lower. "We haven't released our Microsoft FORTRAN yet."

In my moment of despair I once again buried my head in the (Old Black) Osborne *User's Guide*. I must have slipped into the Twilight Zone because the first page I opened to was page 177, and my eyes landed on the sentence: "CBASIC programs DO NOT required line numbers..." Eureka! Looks like FORTRAN! The more I read the more I liked it. To be perfectly honest, I'm somewhat of a novice at micro programming. Most of what I know came from the standard college course "FORTRAN for Humans."

My next discovery was that CBASIC allows you to "toggle" the printer and console by a single statement in the program, a feature that I'd learned to appreciate when using Northstar BASIC a few years ago.

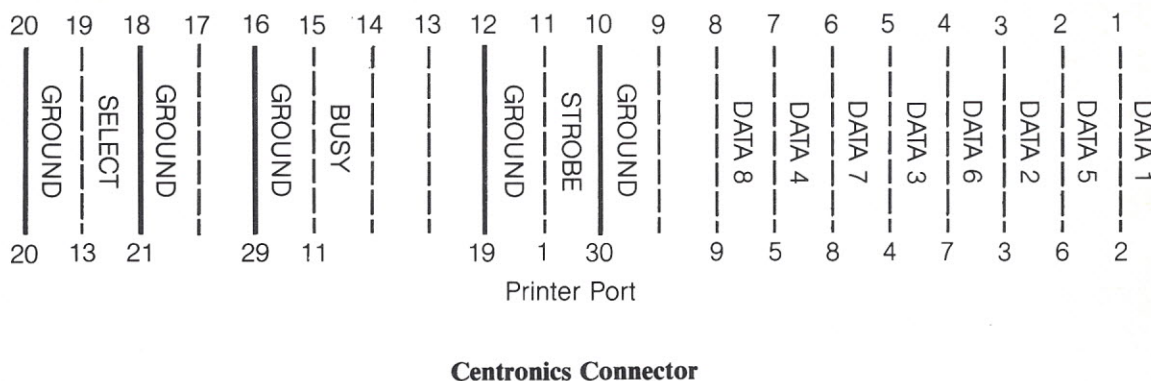
I searched the CBASIC part of the manual seeking (again in vain) a discussion of function precision. After lapsing into a mild coma from flipping pages back and forth, I decided to write another podunk program to crank out pi, but this time in CBAS2. I carefully followed the directions in (measley) Chapter 6 and in no time had a program compiled in CBAS2 that gave  $\pi = 3.14159265358979!$  "Hurray," I yelled, "That's more like it!" Next I ripped out a few sines and cosines and found them to be accurate to 14 places!

Being semi-sold on CBASIC, I rushed down to the local computer store and picked up the book: *CBASIC USER GUIDE* by Osborne, Eubanks, and McNiff. This book is GREAT. It tells you what you want to know, clearly and directly. It covers the subject of CBASIC programming completely and inexpensively.

Some more goodies about CBAS2 came to my attention. CBASIC is compatible with CP/M like Rochester carburetors are to Chevys. (Eubanks, who created CBASIC, is now the language "Big Wig" at Digital Research). As all the CBASIC buffs know, it has the best of two worlds: A compiler and an interpreter, real good file handling capabilities, and lower memory re-



### OSBORNE IEEE-488 Port, Centronics configured



### Parallel Versus Serial Communication

Now that both parallel and serial communication systems have been discussed, let us compare them listing the advantages and disadvantages between the two.

The distance parallel data transfer can traverse is very limited, usually less than 50 feet while serial data can be transmitted thousands of feet. Harmful capacitance and inductance (electrical terminology for signal-stealing or masking effects) with parallel lines is a problem that occurs on longer cables, which is why we recommend keeping your cables to a minimum length. As the distance increases, another important problem called "skewing" occurs in parallel data transfer. This is caused by larger than normal discrepancies in the length of time it takes the 8 individual data bits to reach their destination.

Phone lines could be used to transmit parallel data over long distances by transforming parallel data into serial data and then back again at the destination site. This method requires expensive support hardware and is not commonly used with microcomputer systems.

What makes parallel communications important is its faster rate of data transfer. Serial interfacing is no slouch in the speed department either, but parallel data paths are generally faster, sometimes by magnitude of 10 or more. With most printers, speed is not an important consideration when choosing between serial or parallel methods of interfacing; however, it is important when interfacing with high speed peripherals such as hard disks.

### Centronics Cabling

Centronics-compatible printers require use of a flat-ribbon cable wired to a Centronics connector on the printer side, and a card-edge connector on the Osborne side. The flat ribbon cable is easily connected to the IEEE card-edge connector; a round cable increases the labor required for construction.

Unfortunately, a flat cable may lead to problems with noise and unwanted signals on the lines when communicating over long distances. Twisted pair grounds in a cable reduces the capacitance and inductance of that wire set, and generally minimizes unwanted signals. (Theoretically, an interfering signal is induced equally into both lines of the twisted pair producing a magnetic field current that cancels out between conductors. Whew!)

Twisted pair flat cable is expensive and difficult to find. An alternative is to use standard common, flat ribbon cable, and to surround the important lines with "returns to ground." Below is a diagram of such a cable that works with the majority of "Centronics"-compatible printers.

Note that on the strobe and select lines, adjacent lines are returns to ground.

In the next issue I'll discuss what communications protocols are and why they are important, tricks on using WordStar's and SuperCalc's installation programs, and generally how to get the most out of your printer. B.B.



*(In preparing content for each issue of The Portable Companion, we try to find something for both the novice and advance computer user. If you're a novice, be advised that the following article wasn't intended for you. This is an article for the computer literates among our readers.)*

Here is a little utility that is both useful and instructive. At the same time, it is very dangerous to use; because it allows you to access and modify your Osborne 1 diskettes directly, without regard to CP/M file-structure. NOTE: if you are ignorant about the ins and outs of diskette input/output and prefer to remain that way, you'd better skip this article completely. If you do read on, be especially sure to heed the warnings at the end of the article.

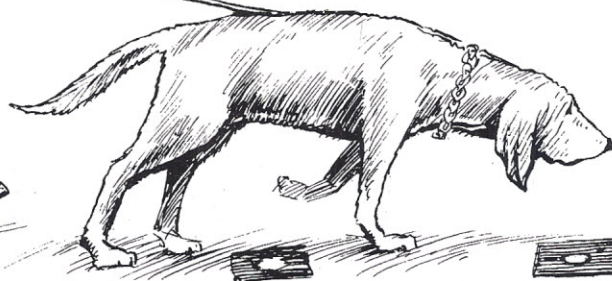
A diskette is physically nothing more than a piece of plastic that has been coated with a type of magnetic material and then inserted into a protective jacket. When given the proper control signals, your Osborne 1 disk drives can read data from a diskette or write data to a diskette by influencing the magnetic coating of the diskette in much the same way a tape-recorder influences the magnetic coating on recording tape.

The arrangement of data on diskette is an elaborate matter. First, the diskette is divided into "tracks." Tracks are merely concentric circles on the disk. Osborne 1 diskettes have 40 tracks. Next, tracks are divided into "sectors." Sectors are slippery characters on the Osborne 1. Physically, there are ten sectors of 256 bytes each on a track of an Osborne single density diskette. The diskettes do not come this way: they are "soft-sectored," which means that the formatting program decides where the sectors are and how they are to be designated. Normally these physical sectors are numbered 0, 1, . . . , 9, although if you ever try to read your diskettes on a different make of computer you may find that it is necessary to refer to these physical sectors as 1, 2, . . . , 10. In any case, you won't have to worry about all of that, because these ten physical sectors are divided into twenty "logical sectors." Henceforth, whenever we refer to a sector we will mean logical sector rather than physical sector.

Normally, the user never hears about any of this (except for the "bdos error: bad sector" message he contends with constantly). CP/M relieves the user of having to think about tracks and sectors by dividing disk data into "files." A file is merely a group of sectors that are considered as one logical entity. CP/M itself keeps track of which sectors belong to which files. It does this by using most of track 3 (tracks are numbered from zero) on every disk. In the directory, one finds the names of all the files on the diskette and information about the allocation of disk sectors.

**Brett D. DePaola and Ronald S. Burkey**

# Disk snooping: an assembly language utility for the curious





quirements. According to the book, "CBASIC conserves memory almost as well as a compiler, plus having features not available on most compilers." By the time I got to page 3 of the *CBASIC USER GUIDE*, I was dang near sold. Then I read the back cover. "It may be the ONLY computer language you'll ever need to learn."

Being the suspicious character I am, I decided to test both memory and execution speed compared to MBASIC-80. As for memory, CBASIC comes out way ahead. After loading MBASIC into memory you have 29,523 bytes free. After CBASIC (CRUN2) is loaded, you have 37,172 bytes free. That's nearly an 8K (7,650 bytes +/-) savings in memory. As far as I'm concerned, that could be critical on a 64K machine.

As for execution speed, CBASIC doesn't fare as well as expected. To test execution speed I wrote a little program that extracts all the prime numbers from 2 to 1000 and outputs them to the console. The time includes "load time" from the system.

Here is what I found:

VARIABLE TYPE	MBASIC-80 (min:sec)	CBASIC (min:sec)
REAL	1:58	3:50
INTEGER	1.38	1.57

It's interesting to note that when CBASIC is running with variables it isn't even close to MBASIC. No doubt because it has to stash reserved space in memory. But the fact remains that even when running integers it doesn't beat MBASIC.

In closing I'll say that each of the software packs that come with the Osborne are excellent. I'm especially glad that CBAS2 is included for programmers who want a semi-compiler language that is a sort of cross breed between FORTRAN and BASIC, has good file capabilities, low memory overhead, and is truly akin to the CP/M operating system. Microsoft BASIC is also excellent for quick and easy programming because it's simple to learn and easy to use.

A word of encouragement to programmers who haven't used CBASIC: CBASIC syntax is a little different than MBASIC. Since it's compiled you don't find your errors until you get the statistics after compilation. Don't get too discouraged if you have to jump back and forth to re-edit then re-compile over and over. Very soon you will be writing relatively large, complicated programs with the "No Errors Detected" statistic appearing more and more. Since most of us have the single-density drives it's best to put WordStar on one diskette (delete the SAMPLE.TXT and AUTOST) and CBAS2 and CRUN2 on another. You can then edit and compile by simply jumping between drives. (WS,CBAS2, and CRUN2 won't ALL fit on one disk.) You can program a function key to do the tedious stuff, (0:A:WS <CR> LB: <CR> >N) will switch drives and go to non-document editing. The possibilities for short-cuts are almost endless with the

nifty SETUP utility. Pretty soon you know most of the compiler error message codes by heart. If you don't have a printer you can toggle the listing and the creation of the intermediate language file. This reduces the time for detecting errors considerably. (The command is CBAS2 PROGRAM \$BC.)

Like anything else, learning CBASIC takes devotion and involves a lot of disk drive grinding. Lately, when relatives come over and urge me to eat and comb my hair—I call them "The Watchcare"—I just look up from the monitor and say, "Guess what. I went down to the computer store to buy a bunch of software, and the guy THREW IN A FREE COMPUTER!" I then ramble on awhile about BCD floating point REALS or explain that my chaining compiler directive had bad stats which dumped me into the system. As I babble this mindless jibberish my disk drives are jabbering back and forth with the little red lights going on and off. By then the intruders begin to look askance at me, as though I had a bad sector.

I always warn my mother never to give me directions which say REPEAT without providing a way out. I mean after all, I could spend the rest of my life caught in an infinite loop of some kind. Like the time I went through a whole bottle of shampoo in the shower because the directions said, "WET HAIR. APPLY SHAMPOO. LATHER. RINSE. REPEAT." Finally, my teenage daughter, with her acute sense of Dad's propensity for algorithmic situational dilemmas, leaned inside the bathroom door and yelled, "Hey Dad' GOTO END."

*Publisher's note: Mr. Henry raises some very good points regarding the differences between CBASIC and MBASIC. I'd like to elaborate on two of them:*

- 1) CBASIC always uses an internal representation for numbers known as BCD (binary-coded decimal). Variable values coded this way take up a bit more room, and slower program execution of math functions is almost always a side effect. MBASIC uses straight binary representation, which makes the storage of values more efficient, less precise, and results in greater execution speed. Ever wonder why Osborne provides two BASICs with our machine? Part of the reason is what I've just described: Some people need accuracy, some speed.
- 2) Don't get hung up on precision unless you need it. Henry has a legitimate need. I assume that the information he puts into his program is of equal precision to the results he requires. Most people who use computers don't realize the significance of that sentence: what you put in should relate to what you want out. consider this absurd example:

$$2 + 2 = 4.000001$$

The statement is absolutely correct, if you strictly follow standard use of precision (2+2 cannot even equal 4.0 using such rigid definitions). Just remember this simple rule: precision is what you make it, and too often people make it wrong.—th



```

;
; DISKMONITOR UTILITY
;
RDSEC EQU 0E527H ;BIOS ENTRY POINT FOR READING A SECTOR
WRSEC EQU 0E52AH ;BIOS ENTRY POINT FOR WRITING TO A SECTOR

SELDSK EQU 0E51BH ;SELECT A DISK DRIVE
SETDMA EQU 0E524H ;SET READ/WRITE BUFFER ADDRESS
SETTRK EQU 0E51EH ;SET TRACK TO READ/WRITE
SETSEC EQU 0E521H ;SET SECTOR TO READ/WRITE
NTRY EQU 0005H
ORG 0100H
COMM
ORG 0105H

;
DDTGO: RST 7 ;RETURN TO DDT
;
; THE COMMAND MODE - CONTROLS THE MAIN MENU
;
COMM: CALL CHKPRM ;PRINT THE EXISTING PARAMETER VALUES
LXI D,CMENU ;READY THE COMMAND MENU
MVI C,9 ;PREPARE TO PRINT IT
CALL NTRY ;DO IT!
MVI C,1 ;GET COMMAND
CALL NTRY
SUI 41H ;IF A (<) 0,1,2, ... ,25
CPI 26 ;GOTO COMM
JNC COMM ;CLEAR THE CARRY
CMC ;A=0,2,4, ... ,50
RAL ;PUT A INTO DE
MOV E,A
MVI D,0
LXI H,JMPTBL ;HL=JUMP-TABLE
DAD D ;HL=JUMP-ADDRESS
XCHG ;DE=JUMP-ADDRESS
LDAX D
MOV L,A ;PUT THE CONTENTS
INX D ;OF THE JUMP-ADDRESS
LDAX D ;INTO THE HL
MOV H,A ;REGISTER PAIR
PCHL ;JUMP BY SWITCHING HL AND SP

;
; SUBROUTINE TO WRITE TO THE DISK
;
WRITE: LXI D,P5 ;SEND THE PROMPT
CALL STRSND
CALL BTGET ;READ THE # OF SECTORS TO WRITE
PUSH PSW ;SAVE THIS NUMBER!
LOOPW: POP PSW ;REGET THIS NUMBER
CPI 00 ;QUIT IF # OF SECTORS =0
JZ COMM
DCR A ;DECREMENT # OF SECTORS TO WRITE
PUSH PSW ;RESAVE THIS NUMBER
CALL PREPAR ;"PREPARE" PARAMETERS FOR WRITING
CALL WRSEC ;WRITE!
CALL MEMFIX ;ADJUST THE BUFFER STARTING LOCATION
CALL PRFIX ;AND THE SECTOR # FOR THE NEXT WRITE
JMP LOOPW ;RETURN TO DDT

;
; SUBROUTINE TO READ THE DISK
;
READ: LXI D,P6 ;SEND THE PROMPT
CALL STRSND
CALL BTGET ;GET THE # OF SECTORS TO READ
PUSH PSW ;SAVE THIS NUMBER
LOOPR: POP PSW ;BEGIN READ LOOP
CPI 00 ;IF THE # OF SECTORS LEFT TO READ
JZ COMM ;IS 0 THEN RETURN TO COMMAND MODE
DCR A ;REDUCE THE # OF SECTORS LEFT TO READ
PUSH PSW ;BY 1 AND SAVE THIS NUMBER
CALL PREPAR ;"PREPARE" PARAMETERS FOR READING
CALL MEMFIX ;ADJUST THE BUFFER STARTING LOCATION
CALL PRFIX ;AND THE SECTOR # FOR THE NEXT READ
LOOP: CALL RDSEC ;READ!
CPI 1 ;IF A=1 THEN THERE WAS A READ ERROR
CZ ERROR ;IN THAT CASE PRINT ERROR MSG
CPI 0FFH ;IF A=FF THEN DISK WAS "BUSY"
JZ LOOP ;IN THAT CASE TRY AGAIN
JMP LOOPR ;RETURN TO DDT

;
; ROUTINE TO INCREMENT THE BUFFER STARTING
; LOCATION BY 128 BYTES
;
MEMFIX: LHLD KDMA ;PUT THE EXISTING STARTING LOCATION INTO
LXI D,128 ;HL
DAD D ;THEN ADD 128 TO IT
SHLD KDMA ;PUT THE NEW STARTING ADDRESS BACK INTO
RET ;KDMA, THEN QUIT

;
; SUBROUTINE WHICH UPDATES THE OTHER PARAMETERS
;
PRFIX: LDA KSEC ;UPDATE CURRENT SECTOR NUMBER
INR A
CPI 20 ;IF IT IS = TO 20 THEN SET IT
JNZ PRCONT ;TO 0 AND INCREMENT THE TRACK #
LDA KTRK ;BY 1 OTHERWISE JUMP TO PRCONT
INR A ;AND THEN RETURN
STA KTRK
MVI A,00
PRCONT: STA KSEC
RET

;
; SUBROUTINE WHICH PRINTS A READ ERROR MESSAGE AND THE
; CURRENT PARAMETERS WHEN CALLED
;
ERROR: LXI D,MES ;PREPARE TO SEND ERROR MESSAGE
CALL STRSND ;SEND IT!
CALL CHKPRM ;DISPLAY PARAMETERS

```

```

RET
;
; SUBROUTINE WHICH PREPARES FOR A DISK READ OR WRITE
;
PREPAR: LDA KDRV ;PUT DRIVE # IN A (0 IS A), 1 IS B)
MOV C,A ;A -> C
CALL SELDSK ;SET THE DISK!
LDA KTRK ;PUT TRACK # IN A
MOV C,A ;A -> C
CALL SETTRK ;SET THE TRACK!
LDA KSEC ;PUT SECTOR # IN A
MOV C,A ;A -> C
CALL SETSEC ;SET THE SECTOR!
LHLD KDMA ;PUT THE STARTING ADDRESS OF READ/WRITE
MOV B,H ;BUFFER INTO A
MOV C,L
CALL SETDMA ;SET THE BUFFER!
RET

;
; SUBROUTINE WHICH DISPLAYS THE CURRENT PARAMETERS
;
CHKPRM: LXI D,STR1 ;SEND DRIVE # MESSAGE
CALL STRSND
LDA KDRV ;SEE WHAT'S IN KDRV
CPI 00 ;IF IT'S A 00 THEN LEAP
JZ ALOOP ;AHEAD TO ALOOP
MVI E,'B' ;OTHERWISE PREPARE TO PRINT A "B"
AOUT: JMP AOUT ;SKIP AROUND THIS PART
MVI E,'A' ;PREPARE TO PRINT AN "A"
AOUT: MVI C,2 ;PRINT WHATEVER WAS PREPARED
CALL NTRY
LXI D,STR2 ;SEND TRACK # MESSAGE
CALL STRSND
LDA KTRK ;SEE WHAT'S IN KTRK
CALL GETR
LXI D,STR3 ;SEND SECTOR # MESSAGE
CALL STRSND
LDA KSEC ;SEE WHAT'S IN KSEC
CALL GETR
LXI D,STR4 ;SEND BUFFER LOCATION MESSAGE
CALL STRSND
LDA KDMA+1 ;SEE WHAT'S IN KDMA+1
CALL GETR
LDA KDMA ;SEE WHAT'S IN KDMA
CALL CNVRT ;CONVERT IT TO 2 ASCII
MVI C,2 ;CHARACTERS
MOV E,H ;AND SEND THEM TO THE CONSOLE
PUSH B ;PRESERVE REGISTERS
PUSH H
CALL NTRY ;PRINT!
POP H ;REGET REGISTERS
POP B
MOV E,L ;PRINT THE SECOND BYTE
CALL NTRY
RET

;
; SUBROUTINE TO SEND STRINGS TO THE CONSOLE
;
STRSND: MVI C,9 ;9 IS SYSTEM FUNCTION FOR SENDING
CALL NTRY ;STRINGS
RET

;
; SUBROUTINE TO "CONVERT" 1 HEX BYTE INTO 2 ASCII BYTES
; AND STORES THEM IN HL
;
CNVRT: PUSH PSW ;SAVE THE BYTE
ANI 00001111B ;ZERO THE HIGH NYBBLE
CALL DOVRT ;CONVERT THE LOW NYBBLE
MOV L,A ;STORE IT IN L
POP PSW ;REGET THE BYTE
RRC ;MOVE THE HIGH NYBBLE
RRC ;TO WHERE THE LOW NYBBLE WAS
ANI 00001111B ;ZERO THE HIGH NYBBLE
CALL DOVRT ;CONVERT THE LOW NYBBLE
MOV H,A ;STORE IT IN H
RET

;
; SUBROUTINE TO GIVE THE ASCII FORM OF
; A HEX NUMBER
;
DOVRT: CPI 0AH ;IF THE NUMBER IS LESS THAN
JC NUM1 ;0A THEN GOTO NUM1
ADI 37H ;OTHERWISE ADD 37H
RET
NUM1: ADI 30H ;ADD 30H TO THE NUMBER
RET

;
; SUBROUTINE TO CHANGE THE DRIVE
;
CHDR: LXI D,P1 ;SEND THE PROMPT
CALL STRSND
MVI C,1 ;READ THE DRIVE CHOICE
CALL NTRY
CPI 41H ;IF IT'S AN 'A' ...
JZ CHDRA ;THEN JUMP AHEAD
MVI A,01 ;OTHERWISE MAKE IT A 'B'
JMP SNDDSK
CHDRA: MVI A,00 ;MAKE IT AN 'A'
SNDDSK: STA KDRV ;STORE CHOICE IN KDRV
JMP COMM

;
; SUBROUTINE TO CHANGE THE TRACK
;
CHTRK: LXI D,P2 ;SEND THE PROMPT
CALL STRSND

```



So what's wrong with that? Nothing really, in a perfect world (counting curiosity as an imperfection). In a perfect world, data always comes in files, and there isn't the slightest reason to access the diskette sector by sector (which is what our utility, "DISKMON," allows you to do). The world, however, is not perfect and we must take into account several facts:

1) Try as we might, we cannot pretend that disk operations are always smooth. Even the most careful operator runs into a power failure during a critical disk write that makes lunchmeat of a valuable diskette. Lesser mortals suffer more frequent errors, since they occasionally do such things as erasing the current copy of their latest program, or turning off the computer before closing an open file. Worse, diskettes sometimes self-destruct for no apparent reason (though, fortunately, very seldom). The knowledgeable user can recover from these mishaps if he can access individual sectors of the disk. He can hunt through the diskette looking for this lost data or he can even repair damaged sectors (that is, sectors with improper data in them).

2) Some people have more curiosity than the proverbial cat and must know how data is laid out on the diskette simply because the user's manual strongly discourages doing so.

3) On a system disk, tracks 0, 1, and 2 hold the CP/M system. On a non-system disk, these tracks, of course, do not hold a system. In fact, they are not used at all. However, if you could gain access to these tracks, you could use this otherwise wasted space for your own purposes. Exploitation of these free tracks may be the subject of a future article.

We present the DISKMON (DISK MONitor) utility with the foregoing reservations. DISKMON works in conjunction with DDT, the useful machine-language monitor provided with the Osborne 1. Basically, DISKMON can read a sequence of sectors from disk into memory, or vice-versa, and can jump to DDT to allow disassembly or modification of what has been read.

How to use DISKMON: first, of course, you must enter the assembly-language listing included with this article using the non-document file creation function of WordStar, assemble it with ASM.COM, and load it with LOAD.COM. How to use DISKMON: first, of course, you must enter the assembly-language listing included with this article using the non-document file creation function of WordStar, assemble it with ASM.COM, and load it with LOAD.COM. (We have assumed a 60K system, and if you are using some smaller system the initial "EQU" statements must be changed to reflect that fact.) Run DISKMON by typing:

#### DDT DISKMON.COM

(preceding either or both "DDT" and "DISKMON.COM" by the appropriate drive name.) At this point, you are in DDT and may perform any DDT function except those that will destroy DISKMON, which is located at hexadecimal addresses 0100-05FF. In particular, do not load any other files using the DDT I and R commands. To perform somedirect disk input/output type:

#### G100,105

which sends you to the DISKMON command menu.

Now you can do any or all of the following:

- A) Choose the drive on which future diskette input/output is to occur.
- B) Choose the starting track number for such operations.
- C) Choose the starting sector number for such operations.
- D) Choose the starting memory address for such operations

Options A-D set parameters to be used when the diskette is actually read (option G) or written to (option H). The read and write commands, explained below, update the sector number, track number, and memory location as they work. These parameters are printed on the screen every time the command menu is presented. Further options are:

- E) Save present parameters.
- F) Restore old parameters.

Options E-F are a convenience when you are continually using the same sector number, track number, and memory location. The final options are:

- G) Read sector(s).
- H) Write sector(s).
- I) Go to DDT.
- J) Go to CP/M command mode.

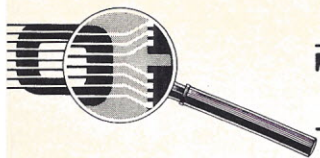
A typical session might go something like this: set into DISKMON as described above. Use options A-D to set drive = B, track = 00, sector = 00, memory address = 0600. (Incidentally, all numbers in all options are two-digit hexadecimal, except memory addresses, which are four-digit hexadecimal.) Now use option E to save this parameter pattern. Strictly speaking, these steps would not be necessary in this example, since these are the default setting. Use option G to read 60 (decimal) sectors. (Option G prompts you for the number of sectors, so you request 3C, which is the hexadecimal equivalent of 60.) You would now have tracks 0-2 in memory, starting at 0600 (hex). Use option I to get into DDT. While in DDT, examine and modify. Type G100,105 to get back into DISKMON. Use option F to restore the parameter values track = 00, sector = 00, memory address = 0600. Use option H to save 60 sectors. Use option J to quit.

*Finally, a word of warning!* This utility is very dangerous, particularly the sector-write operation. Never use DISKMON on a diskette for which you have no backup unless it is absolutely unavoidable, and only then if you know precisely what you are doing. Some sectors of the diskette contain valuable information and access is not directly allowed by CP/M for just that reason. For example, the sample session above would make the diskette involved unbootable, unless you confined yourself to innocuous modifications such as changing the copyright notice.

In short, this program can help you fix—or destroy—diskettes depending on how you use it. DISKMON provides facilities, and though they are included in the Disk Doctor package, they are found nowhere in the utilities provided free with the Osborne 1.







# The Trantor Hard Disk

Yati Sahae

It was the summer of 1981. I was undergoing two major changes in my life. First, I had quit my job after 13 years of working in Research and development groups of various companies to become a consultant. One of our clients was Osborne Computer Corporation. Secondly, I was marrying into a family which owned three travel agencies, which were managed by my mother-in-law.

One of the agencies had recently installed a computer system, so naturally the new son-in-law "computer expert" was eagerly shown this wonderful machine. Of course—it couldn't do *this*, and they didn't like the way it did *that*, but all-in-all wasn't automation wonderful? Eager to please my new mother-in-law, I confidently asserted that a much better job could be done, and on a machine which used standard software. As an added bonus the machine could be used to do other functions besides meeting travel agency requirements. (The travel agency system purchased by my mother-in-law worked on a modified Northstar Horizon, so that no off-the-shelf Northstar DOS or CP/M software could run on it—can you imagine?)

I proposed to develop a menu-driven system using dBASE II and an Osborne 1 computer. My mother-in-law was taken with the Osborne 1's price and portability, so we set about defining the system and implementing it. By fall of 1981 we had a travel agency package operational and undergoing extensive tests. There was, however, one problem.

Most travel agencies process between 500 and 2000 transactions a month. The Osborne 1, while suitable in all other respects, just did not have enough capacity to store more than two weeks transactions online, and therefore, could not do simple monthly reports like profit and loss statements or cruise sales as required by a travel agency manager. We felt that the system could be marketed successfully if this problem could be licked.

The 5¼" winchesters had recently been introduced in the market place. I reasoned that a 5¼" winchester disk system could be developed for the Osborne 1, but that it would be too expensive if sold for use with the travel agency system only. In order to keep the price reasonable it would have to be marketed to other Osborne users as well.

After some investigation and a lot of encouragement from people within OCC, I felt that a market existed for such a product. My next step was to define the development needs of the product and the skills and energy needed to manufacture the product and market it.

Working on my own, and with mostly my own skills, I finished development of the Hard Disk System by December, 1981. In January of 1982 a Trantor Hard Disk prototype, working together with the Osborne and the Travel Agency Management Software, was displayed at the Travel Industry Automation Fair at the Hyatt Regency in San Francisco. This package is now being marketed by ATC, Inc. of Palo Alto.

Several other events occurred in January, 1982:

I asked several people to meet with me to explore the possibilities of forming a company to manufacture

and market the Trantor Hard Disk. The skills and the backgrounds of the people meeting that day included software development, electrical engineering, mechanical engineering, marketing and sales, and accounting and finance. The group decided to form a company and set about registering it with the State of California. On February 22, 1982, Trantor Systems, Limited became official.

A Trantor Hard Disk was delivered to Thom Hogan of OCC for further testing in the Beta Test stage. Thom is still using that unit.

Rigorous testing of other prototypes continued through January and through March, 1982.

During the final stages of testing, some decisions had to be made regarding the hard disk. The size of the enclosure that held the components was one. We knew that many of our customers would also have an external video monitor. Therefore the size chosen was such that a monitor could easily be placed on top of the disk drive to make effective use of desk space. Another issue was the back-up facility. Should additional hardware be added to the disk unit, raising its price, to provide backup? Instead we chose to use the existing floppies and developed software to archive selected files.

Initial advertising was modest; a small ad in *Infoworld* appeared in April and ran for several months. As inquiries began to pour in, manufacturing began, with each unit being rigorously tested. About this time my wife threatened to take drastic action of our productions facilities in the dining room, bedroom and garage were not moved post haste to a more suitable location. Sales were slow, but the market had responded, and Trantor felt justified in moving into larger facilities by June 1, 1982, three months after registration. These are the current facilities at 4432-I Enterprise Street, Fremont, California.

Advertising and promotion were increasing to include a full page ad in *The Portable Companion*, contact with Osborne Dealers in the U.S. and Canada, and contact with Osborne User's Groups. By August 1982, contact was made with Distributors of Osbornes internationally. As sales and inquiries increased, large scale production management began.

Sensitive to the needs of the marketplace, Trantor continues to develop support software designed to make its products easy to install and use. The company has also begun work on providing increased storage, in the form of 16 Megabyte Hard Disks, and development has been initiated on its second major product—a network/multiplexor to be used with Osborne Computers.


At this writing, eight months after registration, Trantor Hard Disks are in the hands of users across the United States, and in several other countries, with our market base growing every day.

*(Yati Sahae is President of Trantor Systems, Ltd. Yati is a systems development specialist and has worked for several computer companies before forming Trantor. These companies include Honeywell, Control Data, and Four-Phase.)*









Santa has a problem. He simply does not know enough about the many printers, monitors, or hard disks available for the Osborne computer.

Santa was too busy to do any comparison shopping, so he had his hard-working elves compile this wish list for wise shoppers who own Osborne 1 computers (or will have one soon!).

We're happy to present Santa's list of over 20 different printers, 5 kinds of monitors, and 5 manufacturers of Osborne 1-compatible hard disks. In the next issue of **The Portable Companion**, we'll include another Buyer's Guide describing cables, accessories, modems, and various peripheral goodies. Happy Shopping.



C

H R I S T M A S A M P L E R

S



a guide to monitors, printers, and hard disks



### **MICRO COMPUTERS OF NEW ORLEANS**

The WINCHESTER HELIX is available in easy to install 5, 10, and 15 megabyte disk capacities. The data transfer rate is 5 megabits per second with an access time of 8.3 milliseconds. The instructions are easy to follow, and all the necessary interfacing components are included with the hard disk package. Prices: 5 MB, \$2500; 10 MB, \$2800; 15 MB, \$3000.

### **SANTA CLARA SYSTEMS, INC.**

SANTA CLARA SYSTEMS (SCS) recently added the Osborne 1 interface capability to their impressive line of **MINI-MEGA** Winchester hard disks offering storage capability ranging from 5 to 15 megabytes. In January of '83, **SABRINA 8"** Winchester drives will be available for the Osborne 1 providing the user with 10 to 120 megabyte storage. SCS disks are all "software transparent", meaning that the user merely plugs the hard disk into the Osborne 1 and does not need to alter existing hardware or software to use the system; the software making this transparency possible is provided by SCS. The SCS hard disk controller detects and corrects errors, using an "Error Correction Coding" (ECS) system providing more efficient data storage, reducing errors and downtime. Non-recoverable errors are one in one trillion bits read. An internal diagnostic system operates independently from the Osborne, making it easy for the user to separate errors coming from the hard disk and not the Osborne. SCS products allow for backup by storing on optional separate hard disk cartridges, or

high-density floppy disks.

SCS subsystems come complete with host adapter card, drive controller, power supply, cabinet, cables, Disk Operating System software, and operating manual. Installation is quick and simple, with easy-to-follow instructions provided. Prices for the Mini-Mega Series range from \$3,500 to \$5,000.

### **TRANTOR**

The **TRANTOR 5** or 10 megabyte 5¼ Winchester hard disks require a simple 15 minute one time installation to connect it with the Osborne. As in the other hard disk systems, it connects with the IEEE port (used as a parallel port, not as an IEEE 488 bus). The software comes complete with BIOS and software utilities, cable, and instructions. A back-up function is included free, and uses one or more floppy diskettes to archive and restore hard disk files. Disks are software coded and cannot accidentally be restored out of order. Another clever feature is a positioning utility moving the head beyond the inner cylinder to protect the hard disk during shipping or moving. Automatic burst error detection is provided with correction up to 11 bits, and the specified non-recoverable error rate is not expected to exceed one in one trillion bits read. Price: \$3,000 for 5 megabyte disk, \$3,400 for 10 megabyte disk.



# HARD DISKS

Hard disk mass storage systems can provide your Osborne 1 with new speed, convenience, and power. For example: A 5 megabyte system has the same storage capability as that of 55 floppy disks (single density). Imagine storing all of your software and data on one centralized file with room to spare!

The hard disks in this guide were chosen for their expressed ease of use and compatibility with the Osborne 1. All of them use the proven reliability of Winchester technology. The drive is installed in a sealed dust-free environment, and low-mass read/write heads skim over the disk without touching it.

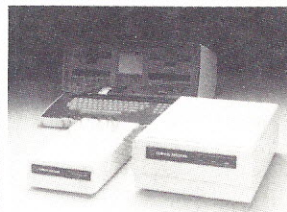
## CORVUS

Winchester CORVUS hard disk systems are available in 6, 11, and 20 megabyte versions and use a microprocessor-based intelligent controller to minimize the software support required by the Osborne. The controller manages bi-directional data transfer between the disk drive and the Osborne's interface and performs several other functions that assure accurate, consistent data transfer. These functions include sector buffering, automatic error retries, transparent formatting, and high-speed transfer, using Direct Memory Access to disk controller memory. The system connects easily by using the cable from the Corvus interface card to the Osborne IEEE port. Corvus provides BIOS drivers and a linkage program that attaches itself to the CP/M operating system.

Corvus also provides CP/M utilities for disk diagnostics, controller code update, and operation of the optional Corvus Mirror video tape backup and archival storage system. Installation Guide and User's Guide included. Prices: 6 MB, \$3195; 11 MB, \$4995; 20 MB, \$5995.

## DESIGN ONE

DESIGN ONE Corporation recently announced its line of 5, 10, 15, and 20 megabyte **portable** Winchester hard disk systems for the Osborne 1. The Design One disk attaches to the IEEE port on the Osborne and is compatible with Osborne 1 software and operating systems. The average access time is a fast 70 milliseconds, transferring data at 5 megabits per second. Each unit comes with cable, software utilities, handle, head landing zone and motor brake. Prices: 5 Mb, \$3095; 10 Mb, \$3395; 15 Mb \$3785; 20 Mb, \$4275.







## P R I N T E R S

Given the bewildering array of printer manufacturers and models that exist on the market today, choosing the right printer can become a most difficult task.

We have listed two basic kinds of printers: dot matrix and letter-quality. Matrix printers generate characters by printing patterns of dots, while letter quality (daisy-wheel or "spinwriter") printers use a print element with fully-formed characters embossed on the petal tips. ("Converted" typewriters such as the IBS Selectric and the Olivetti Praxis require special interfacing and will be listed in the next issue of **The Portable Companion**.)

### ANADEx

Anadex touts their dot matrix **SILENT/SCRIBE DP-9000A**, **DP-9500A**, and **DP-9625A** series of printers as being "soundly designed for unheard of quality." Indeed, the sound level at 3 feet is a quiet 55 decibels while maintaining a speed of 150 to 200 Characters Per Second (CPS). All models feature dot-addressable graphics, parallel or serial ports, complete communications protocols, easy-to-use operator controls, and bidirectional/logic seeking printing. Carriage sizes are 8 or 13 inches; all models are tractor feed only. Weight: 38 lbs. Price: \$1625-\$1845.

### BROTHER

Brother has come out with so many different printers lately it's hard to keep track. First there was the **HR-1** introduced several months ago, and now they have the **DAISY-WRITER** daisy wheel printer charging into the market place. The specifications between the two appear to be identical: 16 CPS, bi-directional, logic seeking printing; friction feed platen is bi-directional; uses IBM Selection type ribbon cartridges (a unique feature); accepts 16½" wide paper with 13" printable line; and has a full range of operator controls and levers. The HR-1 comes in both serial and parallel models. The Daisywriter also comes in two models: the **1500** is the parallel unit while the **2000** is a universal model with parallel, serial, and IEEE488 interfacing. The noise level is about 65 db. Tractor feed mechanism is optional. Weight: 35 LBS. Price: HR-1 only, \$1250 for the serial model and \$1150 for the parallel model.





## MONITORS

All of the monitors described below are 12", reasonable priced and readily available from your local computer retailer. They all connect easily to the Osborne 1, using an inexpensive video adapter. In addition to the Osborne's standard 5" monitor for portable environments, a larger monitor is handy for the home or office. A larger monitor is especially useful with the Osborne 80-Plus column upgrade announced in this issue.

### AMDEK

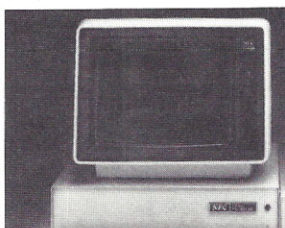
The **AMDEK 300** green phosphor monitor has an easy-to-read, non-glare screen, 18 Mhz band width, 80 x 24 character display, and a horizontal resolution of 900 lines. (Amdek has advertised a **Video-310A** amber monitor for the IBM Personal Computer. It is not known if the monitor is compatible with the Osborne 1 or when Amdek will market general purpose amber monitors.) \$199

### BMC

The **BMC BM-12** green phosphor monitor has a horizontal resolution of 800 lines and a video bandwidth of 20 Mhz. (Company recently came out with an amber monitor which we have not yet tested.) \$200

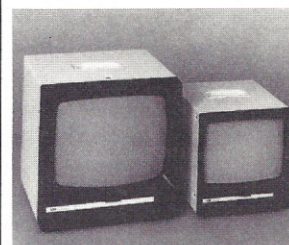
### NEC

The **NEC PC-8041** green phosphor screen is another popular monitor that has been used with the Osborne 1. \$210



### USI

With the introduction of the **PI-3**, **USI** is the first to offer advanced amber monitors in the U.S. Amber appears to reduce eye strain—even after long periods of use. The horizontal resolution is



1000 lines and the bandwidth 20 Mhz. **USI** also makes a 12" green screen monitor, as well as 9" green and amber monitors. Prices: \$210 Green; \$250 Amber.

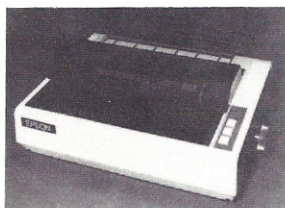
### ZENITH

The **ZENITH TVM-121** features a green phosphor screen. Price: \$175.



## EPSON

Epson needs little in the way of introduction, except to say that it is one of the most widely used printers among Osborne owners. All of the models are 80 CPS dot matrix quality with logic seeking functions. Epson pioneered the first disposable print head—after it has reached a life expectancy of 100 million characters, you snap it out and pop in a new one.



The **EPSON MX-80F/T** uses both Friction and Tractor feed, while the MX-80 uses just the tractor. Grafrax-Plus is Epson's new graphics package and is standard on all Epsos. (The **MX-100** differs from the MX-80 in that it can take wider paper and comes standard with friction/tractor feed mechanisms.) The MX-80 series is a light printer, weighing just 12 lbs. The MX-100 weighs 21 lbs. **EPSON MX-80 F/T**, \$695; **MX-100**, \$895

## IDS

The **IDS PRISM** dot matrix printers offer 110 CPS correspondence quality printing and 200 CPS optional draft quality printing capabilities. The speeds and characters per inch are switch or software selectable. The interesting features are the inexpensive color option and semi-automatic cut sheet feeder. The color feature uses a black, magenta, cyan and yellow ribbon to mix orange, violet, green, and brown. A primary color ribbon (red, blue, green, black) could also be used. High resolution dot addressable graphics are optional. The printer comes in two models: the **PRISM 80** and **132**; they are essentially the same except for carriage width. The **MICRO-PRISM** printer is the newest member of the IDS family. This model features selectable print speeds of 75 CPS and 110 CPS, dot-addressable graphics,



and parallel or serial interfacing. Weight: 24.5 lbs. Prism 80; 29 lbs. Prism 132. Price: Prism 80, \$1300; Prism 132, \$1500; Microprism, \$799.

## NEC

Deviating from the normal printing methods are the **NEC SPINWRITER** printers which use a print "thimble" containing up to 128 fully-formed characters. Most popular for Osborne users are the **NEC 3500** and **7700 SERIES SPINWRITERS**, the latter being the newer second-generation enhanced performance model. Some of the features on the 7700 are: a 55 CPS printing speed, 8085 microprocessor control, one-piece universal power supply, high resolution digital positioning system, special word processing/graphics options, and a full range of paper/forms handling options. The forms handling options include: single and dual input cut-sheet feeders, vertical forms tractor, a bidirectional forms tractor, a bottom feed adapter, and pin-feed platens. An operator can easily and quickly change from one

option to another. Weight: 45.5 lbs. Prices range from \$2200 to \$2650, depending upon options.



NEC also manufactures a dot matrix printer—the **NEC 8023A**. It offers 100 CPS, bi-directional, logic-seeking printing, graphics, parallel interfacing (only), and accommodates roll, fanfold or cutsheet paper. Warranty: 90 days on parts and labor. Weight: 19 lbs. Price: \$695.

## OKIDATA

Okidata is the only printer manufacturer to take some of the responsibility for providing extensive interfacing information WITH the printer. An instruction package gives information for nine popular personal computer systems, including (of course) the Osborne 1. The Osborne section contains information on cable connections, DIP switch settings, and SETUP



## CENTRONICS

Earlier this year, Centronics introduced the **MODEL 122 GRAPHICS** dot matrix printer to their well known line of printers: the Centronics 737 and 739.



The Model 122 is a heavy-duty desk-top printer designed for both data processing and business processing applications. Standard features include: 120 CPS bidirectional/logic seeking printing, a unidirectional graphics mode that is switch selectable for 6 or 8 pins, 132 columns, full operator controls, selectable form lengths, and selectable lines per inch. All Centronics products are supported by a nationwide sales and service organization, which included both on-site and walk-in service centers. Weight: 29 lbs. Price for the parallel version is \$995 while the serial version sells for \$1095.

## C.ITOH

C.Itoh manufactures the **PROWRITER 8510A** dot matrix printer, and two daisy wheel printers: the **STARWRITER F-10** and **PRINTMASTER F-10**. The **PROWRITER** features 120 CPS high speed matrix printing, logic seeking bidirectional printing, high-resolution graphics, parallel or serial ports, and two different carriage sizes. The **PROWRITER** also comes standard with tractor and friction feed mechanisms and a one year warranty on parts and labor. Weight: 18 lbs. Prices: \$595 for the parallel model and \$745 for the serial & parallel version.

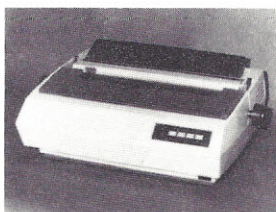
The **STARWRITER F-10** is a 40 CPS fully-formed character printer featuring a low profile design (6" high) that fits easily into your system. It also includes parallel or serial interfaces, low noise operation, and standard friction feed with optional tractor feed is available. Price: \$1995.

The **PRINTMASTER F-10** is a 55 CPS model with the additional capabilities of dual color ribbon and multiple copy printing. The noise level is less than 65 db. Weight: 30 lbs. Price: \$2395.

## DIABLO

A Buyer's Guide on printers would not be complete without saying a few words about the famous **DIABLO 630** 40 CPS daisy wheel printer. Basic specifications are: interchangeable Diablo or Xerox plastic and metal print wheels (the metal wheels impact with a greater g-force resulting in camera-ready print), serial interfacing only, a multitude of operator switches and controls, and six different optional paper handling accessories. Price: Contact dealer.

Diablo has recently introduced a low speed economical daisy wheel printer—the **DIABLO 620**.



The model 620 is designed to support the low-to-moderate output applications. It produces letter quality text operating serially at 300 baud; the print speed is a minimum 20 CPS. It features a new 88 character plastic print wheel with automatic recognition of print wheel type and language, and numerous operator controls and switches. The 620 uses a standard friction feed platen. Price: Contact dealer.



## manufacturers

### **Amdek**

2201 Lively Blvd.  
Elk Grove Village  
Arlington Heights, IL 60007

### **Anadex**

9825 DeSoto Ave  
Chatsworth, CA 91311

### **BMC**

20610 Manhattan Place, Suite 112  
Torrance, CA 90501

### **Brother Industries**

9-35, Horita-dori, Mizuho-ku,  
Nagoya, Japan  
Distributed by:

### **Dynax**

16404 Ishida Ave.  
Gardenia, CA 90248

### **Centronics Data Computer Corporation**

One Wall St.  
Hudson, NH 03051

### **C.Itoh Electronics, Inc.**

5301 Beethoven Street  
Los Angeles, CA 90066  
Distributed by:

### **Leading Edge Products, Inc.**

225 Turnpike St.  
Canton, MA 02021

### **Corvus Systems**

2029 O'Toole Avenue  
San Jose, CA 95131

### **Design One Corporation**

10 Arlive Court  
Rockville, MD 20854

### **Diablo Systems, Inc.**

P.O. Box 5030  
Fremont, CA 94537

### **Epson America, Inc.**

3415 Kashiwa Street  
Torrance, CA 90505

### **Integral Data Systems, Inc.**

Route 13 South  
Milford, New Hampshire 03055

### **Micro Computers of New Orleans**

4539 I-10 Metairie  
New Orleans, LA 70002

### **NEC Information Systems, Inc.**

5 Militia Dr.  
Lexington, MA 02173

### **NEC (Monitors)**

65 Cummings Park  
Woburn, MA 01801

### **Okidata Corporation**

111 Gailther Dr.  
Mt. Laurel, NJ 08054

### **Qume Corporation**

2350 Qume Dr.  
San Jose, CA 95131

### **Santa Clara Systems, Inc.**

560 Division Street  
Campbell, CA 95008

### **Smith-Corona**

Consumer Products, SCM Corp.  
65 Locust Avenue  
New Canaan, CT 06840

### **Star Micronics, Inc.**

Computer Peripherals  
1120 Empire Central Place  
Dallas, Texas 75247

### **Trantor Systems, LTD.**

4432 Enterprise Street, Unit I  
Fremont, CA 94538

### **USI**

71 Park Lane  
Brisbane, CA 94005

### **Zenith**

11000 Seymour Ave.  
Franklin Park, IL 60131

NOTE: The prices listed in this Buyer's Guide are suggested manufacturer's retail prices for single unit purchases and may not reflect the true consumer list price. Computer retailers or peripheral distributors buy in bulk quantities and often receive discounts from the manufacturer; these savings are normally passed along to the consumer.

We suggest that you check with your favorite computer store or peripheral outlet before judging a product based on price alone.



program configurations. Amazingly, a section on how to modify WordStar is also included.



The **MICROLINE 82A** and **83A** offer 120 CPS bidirectional/logic seeking printing, optional graphics package, friction and pin feed paper handling, and optional tractors for variable form widths. The Okidata 84 offers 200 CPS draft mode, and 50 CPS dual-pass, correspondence quality print modes. It also comes standard with dot addressable graphics. Warranty: 90 days parts and labor, one year on print head. Weight: 30 lbs. Price: 82A, \$649; 83A, \$995.

Okidata recently announced the introductions of its **PACEMARK 2410** dot matrix printer. Packed full of rather remarkable features, the printer includes: print modes of 85 (18x18 character matrix) CPS for correspondence quality, 175 CPS in the draft mode, and 350 CPS (9x9

character matrix) for data processing printing; two color printing; resident and downline loadable alternate character sets are standard. A cut sheet feeder is available for the 2410 printer to simplify handling anything from letterhead to memo paper 6" to 14" in width and length. This accessory stacks 200 sheets at a time. Warranty: 90 days parts and labor, six months on print head. Price: \$2850.

#### SMITH-CORONA

The **SMITH-CORONA TP-1** daisy wheel printer delivers fully-formed character printout at a speed of 12 CPS. The printer is a simple, compact, low cost unit offering: parallel or serial interfacing, drop-in ribbon cassettes, different styles of daisy wheel elements, and one front panel operator control. It prints an 88 character ASCII set in either a 10 character per inch or 12 character per inch version. The TP-1 is rather noisy: decibel measurements range from 63 to 69. Service is available through ten Smith-Corona Service Centers in the U.S. Training is also being pro-

vided to those TP-1 dealers who wish to offer their own service. Warranty: 90 days parts and labor. Weight: 21 lbs. Price: \$895.



#### QUME

The Qume Sprint 9 daisy wheel printers come in three versions: the **SPRINT 9/35**, **9/45**, and **9/55**. (The last two digits of the model number indicate the print speed in CPS.) The 9/45 and 9/55 come standard with a friction feed platen, full operator controls and indicators, a multitude of internal controls, and an overall design emphasizing reliability and ease of service. Options include: "W Plot" which increase the vertical resolution from 1/48" to 1/144", bidirectional forms tractor, and cut sheet feeder. Other than speed, the **SPRINT 9/35** differs in that it can be ordered with a keyboard to achieve interactive terminal capability. Weight: 38 lbs (with

keyboard, 42 lbs). Price: 9/35, \$2170; 9/45, \$2255; 9/55, \$2795.

#### STAR MICRONICS

Star Micronics recently introduced the **GEMINI SERIES** of dot matrix printers. Although we did not have an opportunity to evaluate or test the Gemini the specifications indicate it is a 100 CPS, 9x9 character matrix printer. Using the high resolution graphics mode, the matrix is 120x144. Prices are \$500 for the 10" maximum paper width model and \$645 for the 15 1/2" model.



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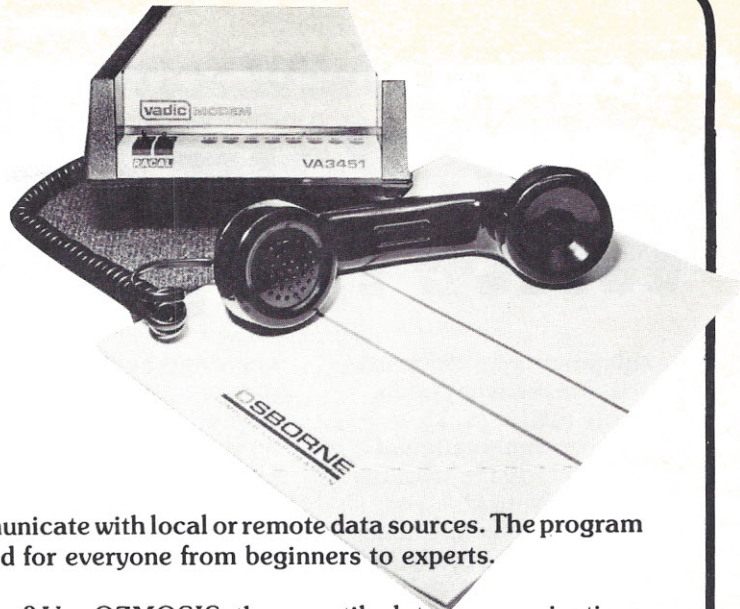
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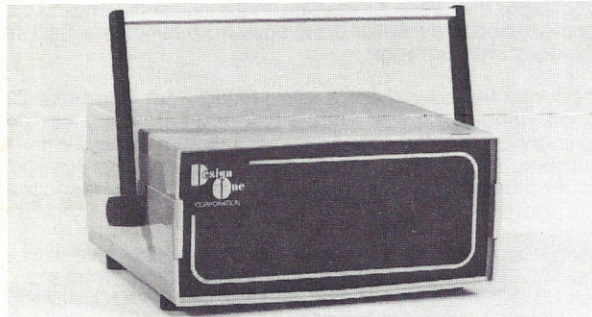
Operators on duty 24 hours daily. Operators cannot answer technical questions. For technical information, dealer inquiries, or orders from other countries, you can call by phone **(904) 269-1918** during office hours Eastern Time, Mon.-Fri. or Telex 62112700.

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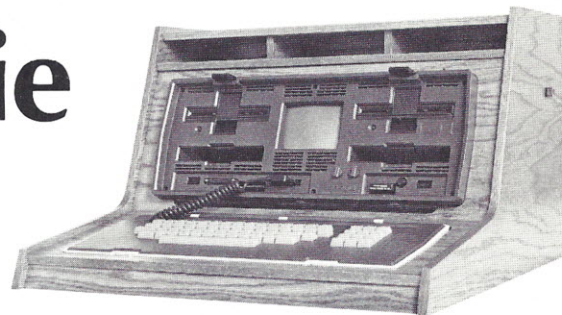
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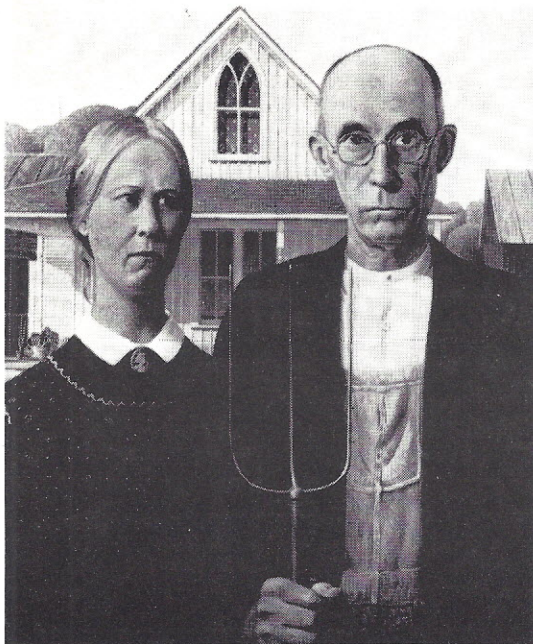
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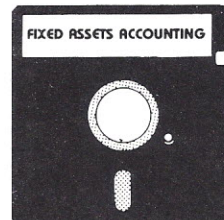
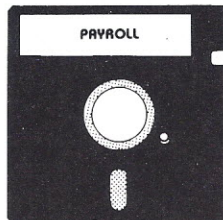
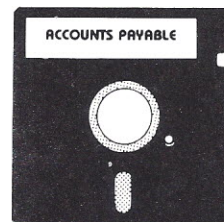
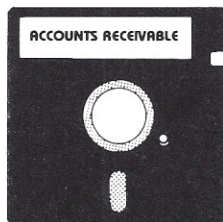
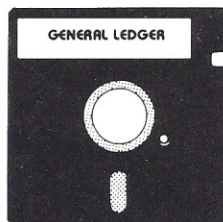
The package includes General Ledger, Payroll, Fixed Asset Accounting, Accounts Receivable, Accounts Payable, Inventory and a Mailing List package. These are all implemented under FULL menu control, integrated, and provide for data entry from fully formatted, fill-in-the-blanks data entry screens.

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<b>Total Assets</b>	<b>1795.25</b>	<b>3935.75</b>	<b>4868.67</b>
<b>LIABILITIES</b>			
Acct.s Payable	915.25	1088.25	2158.75
Storage Costs	75.88	75.88	75.88
Labor	125.82	131.83	138.53
Materials	58.28	81.17	84.23
<b>Total Liabilities</b>	<b>1175.23</b>	<b>1387.13</b>	<b>2457.41</b>
<b>NET</b>			
Dep. Allowance	825.84	2851.42	1975.81
Taxable Income	258.88	258.88	258.88
	375.84	2881.42	1725.81
^ 818 Text="NET Width: 20 Memory: 20 Last Col/Row: 805 ? for HELP 12			

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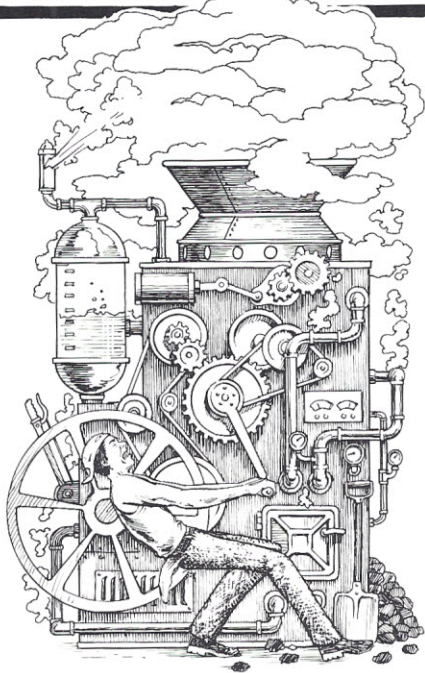
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## Users' Group



### User Group Update

#### Keeping Our Ear To The Ground

The number of Osborne User Groups is rapidly on the rise and we encourage all groups to send their submissions to *The Portable Companion* for inclusion in this section of the magazine. If you have printed articles in your newsletter that would be helpful to other users, please pass them on for reprint. FOG has generously supplied us with most of the material published to date and we'd like to see that supplemented by groups from other parts of the country and world.

Don't forget that the User Update included in each issue can be a vehicle for making announcements and generally getting out information that needs to be communicated beyond territorial boundaries.

We would also like to announce that future issues will include a special section (outside FOG) devoted to mini-reviews of software hardware, books, etc., for the Osborne 1. We encourage all of you to submit your opinions (keep them short) on products and software you have used. Creativity and humor are encouraged.

The following are the latest additions to the burgeoning list of national

Osborne Users' Groups. Enthusiastic and adventurous, most of these groups are printing newsletters that have become valuable support tools to Osborne owners all over the country.

OCC applauds these cooperative efforts by Osborne users to disseminate helpful information about our computer. Please include *The Portable Companion* on your mailing lists for future issues. This enables OCC and the staff of *The Portable Companion* to keep abreast of the many productive and exciting programs your group is involved in and make announcements as necessary to all our readers.

With that said, here are the latest additions to the Osborne user's group list:

John Warner  
Kentucky Osborne Group (KOG)  
219 Burnam Court  
Richmond, Kentucky 40475

James L. Kerr  
Tidewater Area User's Group  
Nuclear Medicine Clinic  
NARMC  
Pensacola, FL 32512

Donald E. Wagner, Controller  
Newark Osborne Users' Group  
c/o The Central Trust Company  
Drawer AE, 17 N. Third Street  
Newark, Ohio 42055

Larry Friedman  
Lawrence Osborne Users' Group  
2819 Tomahawk  
Lawrence, Kansas 66044

Ruben Mizrahi, President  
Jersey Osborne Group (JOG)  
P.O. Box 611  
New Brunswick, New Jersey 08903

**BULLETIN:** You'll be happy to hear that OCC has appointed Esther Massie of our Technical Support Division as User Group liaison. Please write directly to her if you have ideas or problems that need addressing c/o OCC, 26538 Danti Court, Hayward, CA 94545.

### Tips For Tyros

Greg Hinze

*The following article is directed at readers who have access to the FOG DISK LIBRARY. However, if you are not presently involved in FOG, read on, as there are a number of helpful tips for newcomers. You may want to pursue obtaining a copy of the FOG library (the contents of which were listed in the August/Sept. issue of The Portable Companion) by writing directly to FOG at P.O. Box 11683-A, Palo Alto, CA 94306.*

Here is a learning project for those who have just bought their first computer and have had no previous experience. The project will collect four game programs available from the FOG library on one diskette. NOTE: I will use the symbol < CR > to represent "carriage return." To make a < CR > press the RETURN button on the keyboard. "Type" means to physically typewrite (hunt and peck) whatever follows. Don't be afraid of mistakes. If a procedure does not work, just do it over. In all of the following procedures either disk drive A or B, or both alternately, will run. Loading the CHESS or CASTLE games may take a half minute. In any case, let the drive stop and the red light go out before removing a diskette from the drive.







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CARAT",R <cr> ; 5,LOAD"ELIZA  
",R <CR> : 6, LIST <CR> . I have  
placed a <CR> after each name so  
that when you press a function key,  
the game will run immediately without  
requiring a separate <CR> . Notice  
that each of the BASIC programs has  
its name in quotes and is transferred  
from diskette to computer memory by  
the command: LOAD.

Copy this list of SPECIAL FUNC-  
TION KEYS onto a piece of paper for  
future reference. Any or all functions  
can be changed in the future by again  
placing CP/M in Drive A the new  
diskette in B, and using SETUP again  
as described.

Now follow the instructions at the  
bottom of the menu or all is lost. Type  
X twice in succession and the menu  
will display the options: DESTINATION  
(A, B or "X" to exit). Be sure to name  
the drive in which your newly con-  
figured diskette resides. In this case, it  
is B. If you say X for exit, the SFK  
designations will not be saved and all  
will revert to the standard numbers 0  
to 9. When you type B, expect Drive B  
to run for 20 seconds. SETUP is saved  
on the diskette's system tracks, so if  
you copy this diskette, the SPECIAL  
FUNCTION KEYS will also be copied.

The project is complete. Remove  
the CP/M disk from Drive A and

replace it with your new game pro-  
gram diskette. Press RESET on the  
front of the computer and then  
<CR> . Reset erases all data from  
the computer's memory.

Each SFK is formed by combining  
the control (CTRL) key with a number  
key. For example, while you are  
holding down the CTRL key, press the  
number 3 and the CHESS game will  
start on the monitor. Type >C when  
you wish to discontinue the chess pro-  
gram. Since all the other games re-  
quire the use of MBASIC, you must  
first load MBASIC into the computer's  
memory by holding CTRL down and  
simultaneously pressing 1. After the  
disk drive stops, hold CTRL and press  
the number for any game you wish to  
play.

When you are through playing a  
game and wish to see what the BASIC  
program for that game looks like,  
press CTRL C to stop the game from  
"running." Then press CTRL 6 for  
LIST. The listing of BASIC statements  
will flash across the screen. To stop  
them for closer examination, press  
CTRL S. Press any key to view the  
listing again. LIST works for BASIC  
programs only and therefore will not  
work with the CHESS game.

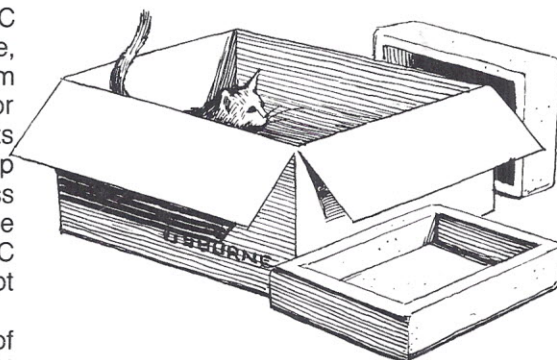
If you wish to see the directory of  
your new game diskette, put the CP/M

diskette in Drive A and your newly  
configured diskette in Drive B. Press  
CTRL C and type XDIR B: <CR> .  
This will display the directory and give  
you the name and size of each pro-  
gram on the diskette. It will also tell  
how much room is available for any  
additional programs you may wish to  
add.

Recording five programs on the  
diskette and typing the six SETUP  
statements took a touch-typist less  
than 15 minutes to complete. Have  
fun.



(Greg Hinze is a member of the First  
Osborne Group FOG)



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First, place the CP/M System Disk in Drive A. Perform a <CR> and the A drive will transfer system information from the CP/M diskette to the computer's memory. Then place a new diskette in Drive B. When the symbol A > appears on the monitor, type COPY <CR> and then, as stated on the displayed menu, type F to format the new diskette in Drive B. When the drive stops, two <CR> take us back to the system and the symbol A >.

Now get the MBASIC diskette and diskettes numbers 004, 015 and 018 from your copies of the FOG DISK LIBRARY.

Next type PIP <CR> and an asterisk will appear on the monitor screen. The asterisk means the computer is ready to copy a file from one diskette to another.

Remove the CP/M diskette from Drive A and replace it with diskette 004. Do NOT execute a <CR> until you are through using PIP. Type B:=A:BAC-CRAT.BAS[v] <CR>, and when the two drives stop spinning, a new asterisk will appear on the monitor.

[v] verifies the correctness of the copied file by causing it to be read back and checked against the source. PIP will work without [v], but why ignore a safety feature?

Now type B:=A:ELIZA.BAS[v] <CR>. Replace diskette 004 with diskette 015 and type B:=A:CASTLE.BAS[v] <CR>. We now have three files on our new disk.

When a program is written in the BASIC language, it is a convention to use .BAS as an extension of file-type, added to the filename. As you can see, the three files we have copied are all written in BASIC. They can be "run" by placing the MBASIC diskette in one drive and the new diskette in the other drive; but now we will copy MBASIC onto the new diskette, so we can "run" the programs with only this one diskette in the computer. Replace diskette 015 with the MBASIC diskette and type B:=A:MBASIC.COM[v] <CR>.

Just for fun lets add a game program that is not written in BASIC and does not require the MBASIC program to run. Replace the MBASIC diskette in Drive A with diskette 018 and type B:=A:CHESS.COM[v] <CR>.

Now replace the 018 diskette in Drive A with the CP/M diskette and press the CTRL key while simultaneously typing C. Our books symbolize this control C operation with the symbol > C. Here we have used > C to get out of the PIP program, and to tell the CP/M operating system that the

diskette has been changed in drive A. Control C does not erase data from the computer's memory. Now type SYSGEN <CR> after which the monitor asks you to specify the SOURCE drive (type A), and the DESTINATION drive (type B) <CR>. After the drive stops, type SETUP <CR>, then type B, and the monitor will display a menu.

Now type E. A new menu will appear that is limited to a listing of the special function keys for the computer. After you define these keys, any one of ten different program names or commands can be requested whenever you wish.

For the moment, just carry out the following steps. Type 1 and then MBASIC <CR> followed by pushing the escape (ESC) key twice in succession. You will see the number 1 on the menu replaced with: MBASIC <CR>. I remind you that I do not mean for you to type the symbol <CR>, but to physically push the RETURN key. It will be displayed as <CR> but function as a RETURN. Now, using the same procedure, type the other key designations as follows: 2, LOAD"CASTLE",R <CR>; 3, CHESS <CR>; 4, LOAD"BAC-

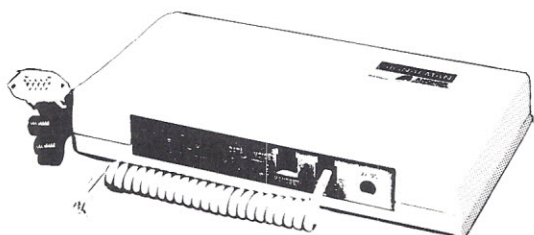
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You can call up B:XXXXXXXXX.DIR under WordStar, and it looks just like an XDIR.COM display, only you can now modify it just like any WordStar file.

There's more.

If you command XDIR B:\*.\* A:XX-XXXXXX there will be a file created on A with the name XXXXXXXX.DIR.

## Putting This To Use

Upon discovering the above, I developed the following Disk Directory routine, which easily solved my problem of what to do with all of those diskettes and files:

Start with an empty, formatted diskette. This will become your directory diskette. We'll call this diskette DD.

Put DD into Drive B and your CP/M System diskette into Drive A: Type SYSGEN. When CP/M asks which diskette you want to Sysgen, tell it B.

Next copy the following files onto DD from the CP/M System diskette using PIP. For those of you who aren't familiar with PIP, see your operating manual under CP/M:

PIP.COM  
XDIR.COM

Now change diskettes in Drive A. Insert the CP/M Utility diskette, and while still in PIP, copy onto DD the file:

AUTOST.COM

Then, (CTRL)C to exit PIP.

You should set up the function keys on DD to make it easier to use. Return the CP/M System diskette to Drive A and enter

A> SETUP(RETURN)

—which will start the program: SETUP.COM.

At the prompt "Which drive do you want to SETUP?" enter B. What you are going to do now is set up function keys that will be handy when using DD. When you see the SETUP screen, press E so that you can set the function keys. Follow the screen prompts and you'll be programming your function keys with ease.

Set the function keys this way:

0: ERA B:  
1: XDIR A: (CTRL)C  
2: XDIR B: (CTRL)C  
3:  
4: XDIR B:\*.\* A:—  
5: XDIR B:\*.\* B:—  
6:  
7: B: = A:  
8: A: = B:  
9: SAVE Ø B:—

The (CTRL)C after XDIR is included here because in some versions of XDIR your diskette space used and space available listing will not reset if you use XDIR several times in a row. The effect of this is that the listed space available for the first diskette you XDIR will be listed again in each successive new listing and you will not get proper space available data for the second diskette you XDIR. Try XDIR a few times on different diskettes. If the space counter does not reset, compensate for the program bug by simply pressing (CTRL)C after each use of XDIR, or using your function key.

Set the Arrow Keys to CP/M, and follow the prompts back out of SETUP, saving your work on the B drive.

## Diskette Identification

Your diskettes need to be identified both on the outside and inside in the data directory.

You should establish some sort of numbering system for your diskettes, if you have not already done so. I simply number mine in numerical order, from 001 to 999. Other people use letters

—A —AA —BA  
—C —AB —BB  
—C —AC —BC . . . etc.

Still others identify the type of file:

—WS-001 —BAS-001  
—WS-004 —BAS-002  
—WS-009 —BAS-004  
—SC-001 —G/L-001  
—SC-002 —G/L-002  
—SC-003 —G/L-006

The choices are wide. Once you

have figured out the system you are going to use, write the identifier of each diskette on it's label with a soft tip, permanent marking pen.

## Data Storage of Diskette I.D.

Many Osborne users are not aware that you can put an entry on the directory tracks of a diskette, without tying up 2K of storage space.

The command, from CP/M is: SAVE Ø B: XXXXXXXX.XXX.

Just fill in your own disk file identifier, up to 8 characters, a period (.) and three more characters.

In practice, don't use the three characters after the period, because they can be changed to lose some meaning.

Since XDIR alphabetizes the files, if you precede the filename with a hyphen (-), your diskette identifier will be the first file in the alphabetical XDIR listing. This is how most public domain software such as the CP/MUG and FOG libraries is identified.

## The Easy Way To Label Diskettes

Put your new completed DD diskette in Drive A and boot it. You should see:

Extended Directory version 3.5

AUTOST	.COM	2K
PIP	.COM	8K
XDIR	.COM	4K

Specified files: 3 files, 14K bytes  
Disk B: 2K blocks  
Size = 92K, Used = 14K, Space = 78K  
A>

Lets say that you will call the first diskette that you are going to label 001. You can fill in any identifier for the diskette you want to label, up to seven characters (remember the hyphen) but for this discussion, let's use 001.

Press (CTRL)9 and you should see:

A> SAVE Ø B:-



## Using XDIR To Create A Disk Directory

Scott Rainey

You may have shared this experience: You suddenly have a lot of diskettes containing somewhere between 5, and 40 files each, and you are not really sure what those cryptic eight character file names really mean.

Perhaps these files are your own creations or maybe you suddenly had to make sense of a large body of files such as the public domain CP/M library; or your new job required you to make sense of 150 diskettes with no external labels.

I was about to go crazy because I couldn't make heads or tails of all of the files I had created, and in addition had acquired over a hundred public domain programs with names like: MASTCAT.COM, FMAP.INT or SZYMERGY.BAS. What in the H--- is a mast cat? Some kind of shipyard feline?

Well I finally figured out what was what but the next problem was keeping track of it all. The solution was hidden within our old friend XDIR.COM.

In this article, I outline a number of

procedures that I have not found in the OCC documentation. Credit should be given to my friend Dennis Deck for showing me the XDIR function in a *Lifelines Newsletter* that makes this directory routine possible.

I have attempted to keep this article on a level suitable for the new Osborne user. Don't let that scare you off if you are an experienced hacker. There may be an idea for you sandwiched in here as well.

Where this article instructs you to supply your own variables I have used X's (XXXXXXXX.XXX) to indicate places for you to fill in those variables.

### XDIR.COM Revisited

An undocumented feature of XDIR allows the creation of WordStar readable and modifiable files, thus enabling you to create a highly versatile range of directories.

You have probably used XDIR.COM, which is on all of the supplied software diskettes that came with

later versions of the Osborne 1. As you know, XDIR will give you a display that looks like figure 1.

Figure 1

```
Extended Directory version 3.5
- 004A . 0k
3 . 6k
3 .BAK 6k
AO . 4k
ED3 . 4k
OSBUG .001 24k
OSBUG .002 2k
OSBUG .BAK 2k
XDIR .COM 4k
STARTREK.BAS 24k
```

```
Specified files: 10 files 76k bytes
Disk B: 2K blocks
Size = 92K, Used = 76K, Space = 14K
```

What may be news is that if instead of typing XDIR B:

You instead type: XDIR B:\*. \* B:XXXXXXXX. you create a file on Drive B with the name XXXXXXXX.DIR.

*Continued on next page*



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```
DEBUG .001      24K
DEBUG .002      2K
DEBUG .BAK      2K
XDIR .COM       4K
STARTREK.BAS    24K
```

```
Specified files: 10 files    76K bytes
Disk B: 2K blocks
Size = 92K, Used =         76K,
      Space =              14K
```

Once the files are copied into DISKDIR, you can clean them up a bit using standard WordStar editing features. It's a good idea to leave a blank line or something between the files, and if you want to keep record of how much diskette space is used, include one of the lines that does this from the XDIR routine.

A cleaned up record might look like this:

```
—004A .DIR      2K
3      .         6K
AO     .         4K
ED3    .         4K
OSBUG .001      24K
OSBUG .002      2K
STARTREK.BAS    24K
```

```
Specified files: 6 files 40K bytes
```

As mentioned above, your Osborne 1 has a limit of about 40 files in each diskette directory. If you exceed this number you will have problems. So, now that you have read all

of the .DIR files into your DISKDIR file, you will want to erase the .DIR files taking up 2K each and a file address on your DD Disk. Save your DISKDIR file, and exit WordStar to CP/M system using (CTRL)KX.

If you get an error message that the diskette is full, you will have to delete some files on DD. That's OK because you were about to delete them anyway. First display the Disk Directory using (CTRL)KF so that you can see which files you will be working with. The .DIR files will all be 2K so you may have to repeat the process. The file deletion command from inside a WordStar file is (CTRL)KJ. Delete a few files and try (CTRL)KX again.

When you get to A > or B > erase all of the .DIR files on DD with a single command using a wildcard asterisk (\*) erase command:

```
B > ERA B:*.DIR
```

check your progress if you wish using:

```
A > XDIR B:
```

then load DD with more .DIR files, by rebooting DD In Drive A and continuing as above.

## The Finishing Touches

Once you have all of your diskette

tes logged into DISKDIR, you can use WordStar to go back and put a short explanation of what the file is all about next to the size of the file. A sample from such a file might look like:

```
CP/M.SYS    CP/M System Diskette
```

```
AUTOST.COM  2K  Auto Start from 0-1 Boot
COPY.COM    4K  Combined Copy and Format Program
FORMAT.COM  2K  Old Format Program,
INSTALL.COM 32K  WordStar Installation Program
MOVCPM.COM 12K  CP/M Customization routines
PIP.COM     8K  Peripheral Interchange Program
SETUP.COM   4K  Setup a Sysgened Diskette
STAT.COM    6K  Status of Used Disk Space
SYSGEN.COM  2K  Copy CP/M to System Tracks of target diskette
```

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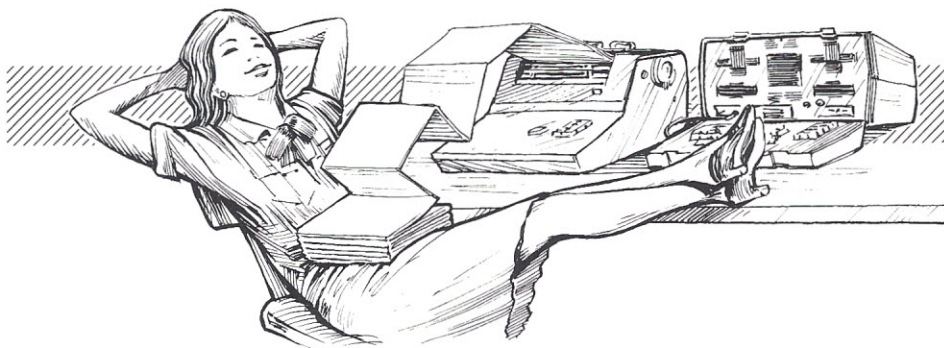
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After the `A> SAVE Ø B:-`, enter 001. Put your file diskette into Drive B and press RETURN.

You should see the `A >` prompt.

Press (CTRL)2, which should give you XDIR B: and you should see:

—001 . 0K

as the first entry in your file.

Repeat this procedure for all of your diskettes.

### Making the Directory

Once you have a data identifier in the directory tracks of all of your diskettes, you are ready to make your directory.

Boot DD in Drive A, then, place each of the diskettes in your library into Drive B (one at a time please). Press (CTRL)4 (you should see `A> X-DIR B:*. * A:-`). Fill in the diskette identifier, which by now you should have written on the outside of the diskette (e.g. -001A) and press RETURN. What you see on the screen should also be stored on DD in Drive A under -001A .DIR.

You can check this using (CTRL)1

which should give you XDIR A:

If you are going to be passing out copies of -001, or if you want to use 2K of the diskette space to make notes to yourself about what is on -001, you may want to (CTRL)5 (XDIR B:\*. \* B:—), add 001 and a copy of XDIR will be made on B. It will be named -001.DIR and you will be able to add notes to it using WordStar.

### The WordStar Part

After you have 20-30 .DIR files on DD you must combine them. The reason for this is that your Osborne has a limit of 40 files per diskette, and of course, each .DIR file will take up 2K. If you already have a couple of big files, you may run out of disk storage.

A record of the files that you will be combining is handy, so if you have a printer, type (CTRL)P then XDIR A:, and your printer will print out XDIR for DD.

Reset, and boot up WordStar in Drive A. Place DD in B, and change the logged drive to B. Create (D or N)

a new file on DD (in B). This will be your directory, so name it something appropriate like DISKDIR.

You will probably want to put some kind of heading at the top of the file like: "DISKDIR: DIRECTORY OF FILES ON LIBRARY DISKS." Skip down a few lines, and use the WordStar command for "copy from another file." Use a (CTRL)KR to bring in the text from all of your .DIR files. When you type (CTRL)KR, WordStar will ask "NAME OF FILE TO READ?" Fill in the name of each of your .DIR files, one at a time, repeating (CTRL)KR each time, until you have copied all of them into DISKDIR.

The printed copy of the files comes in handy to verify that you get all of the files. I usually work from the bottom up. (largest number to smallest number) because of the way WordStar loads a file that you read into a workpiece.

A typical .DIR file will look like this:

Extended Directory version 3.5

-004	.DIR	2K
3	.	6K
3	.BAK	6K
AO	.	4K
ED3	.	4K

*Continued on next page*

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## Users' Group

particular computer. When a program is loaded into the computer by CP/M, that program plays the part of the salesman; the computer plays the part of the office, and the peripherals play the parts of the office staff.

When a program written to run under CP/M sends a character out to the printer, it doesn't have to know what kind of printer is being used, or even the type of computer on which it's being run. CP/M (the office manager) knows all that. The program simply sends a character to CP/M and tells the "Control Program/Monitor" that this character must be sent to the printer. CP/M then takes the character, waits until the printer is ready, sends the character to the printer, and informs the program that the request has been filled.

This "office manager," performs many tasks in the Osborne 1 including the transfer of characters to the screen and printer, the transfer of characters from the keyboard (including those programmed on special function keys), system resets, the opening, closing, and deleting of files, and more. Each computer that runs a version of the CP/M operating system has the option of handling its peripheral in whatever way works best for that computer. Computers

like the Xerox 820, Cromemco, and Osborne 1 each have their own methods of handling printers, disk drives, keyboards and screens. CP/M simply provides the common ground that makes it possible to run one program on any of the many machines equipped with a CP/M operating system.

So where do we locate this wonder called CP/M? Something called the "CP/M image," a copy of the CP/M program is stored on each of the diskettes that come with the Osborne 1. This system image is found on the first three tracks of the diskette tracks 0, 1 and 2. These are called the system tracks. When you first turn power on to the Osborne and follow the instruction to "Insert disk in Drive A and press return," This CP/M image is read from the system tracks of the diskette in Drive A and stored in the memory of the Osborne 1.

Keeping a copy of the CP/M operating system on the system tracks of a diskette can make life a great deal easier. For example, this allows you to boot from those diskettes, that is, to put them into the left drive and press the return key when you first turn on your Osborne. It also keeps you out of trouble when a program you are using tries to access

the system tracks of another diskette. WORDSTAR, PIP, and COPY all do this under certain conditions.

One of the programs found on the CP/M System Diskette is SETUP. Recall that our office manager, CP/M has to be intimately familiar with all of the resources available to it. On the Osborne, this means that CP/M must know all of the details about the printer tied to the system; all about the keyboard, including the meaning of each of the special function keys; the speed (or baud rate) to be used by the serial (RS-232) port, and more. Most of this information was built into our version of CP/M when the folks at Osborne Computer Corporation (OCC) wrote the Basic Input/Output System, otherwise known as the BIOS. But OCC had no way of predicting what kind of printer you would use, at what speed you want to use the RS-232 port, or how you would program the special function keys. Only you can tell CP/M what you've decided to do with your system.

To make this task easier for you, the people at OCC wrote a program called SETUP. This program allows you to change parts of the BIOS in your copy of CP/M by simply answering a few questions. You thereby optimize CP/M for your system and your



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XDIR.COM 4K Extended  
Directory Pro-  
gram listing  
programs  
Alphabetically  
Specified files: 11 files occupy  
76K bytes

## SAMPLE

—004A  
3. 6K Story for  
Vol 2, #3  
AO. 4K *A d a m*  
*Osborne*  
*Bio*  
ED3. 4K *Draft of*  
*Editorial*  
DEBUG.001 24K Vol 1  
debugging  
story  
DEBUG.002 32K Vol 2  
debugging  
story  
STARTREK.BAS 24K *S e m i -*  
*Debugged*  
*Game*

Specified files: 6 files: 92K bytes

There it is folks, go forth and  
catalog.

(Scott Rainey is a member of the  
Portland Osborne Business User's  
Group (OSBUG) and is editor of its  
monthly newsletter.)



## Taking The Mystery Out Of CP/M

John Gaudio

In talking with clients, members of the Denver Osborne Group, and other Osborne users I find that there is still some confusion about just what "CP/M" really is, what it does, and where it's likely to be found.

CP/M is an operating program, versions of which run on many computers including the Osborne 1. It was originally written by Gary Kildall in 1973 for use with his 8080 microcomputer, and has since evolved into the most popular operating system available for 8080, and Z80 micros. The letters "CP/M" stand for "Control Program/ Monitor."

CP/M loads any one of a number of programs into the computer's memory and provides the means for that program to communicate with peripherals such as the video screen, keyboard, disk drives, and printer. It functions in the Osborne the way an office manager functions in one of the branch offices of a large company. That office manager brings visiting salesmen into the office and provides the means for those salesmen to communicate with staff members such as the secretaries in

the typing pool and the filing clerks.

The office manager is specially trained to understand the details of that particular branch office and sees to it that the request, along with the material needed to fill that request makes its way to the hands of the appropriate secretaries and/or file clerks. The office manager then confirms that the request has been filled, and reports back to the salesman when the job is done.

This is just the way that CP/M works for us in the Osborne 1, it plays the role of the office manager. When installed on a computer some parts of CP/M\* are written only to run on that

*Continued on next page*

\*These specially written parts of CP/M make up the Basic Input/Output System, or BIOS, and are like the special training each office manager gets for a specific branch office. For more on BIOS see page 218 of the Osborne CP/M User Guide.

For more information on the origin of CP/M see page 1 of the OSBORNE CP/M USER GUIDE by Thom Hogan, published by Osborne/McGraw-Hill.

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## newProducts

OCC is finally ready to make a few announcements that all of you have been patiently waiting to hear. First, as you've probably discovered by the time this issue reaches your mailbox, Double Density has been released. After many hours of troubleshooting we are confident that we have an excellent product that our users can rely on. Other OCC new product announcements appearing in this issue include the long-awaited 80 Plus Column Option and POWR-PAC, a battery pack for the Osborne 1 computer.

We also have a number of other new products being distributed by outside manufacturers, so without further ado...

### Double Your Pleasure

As you've been advised in our recent mailing to registered Osborne owners, double density is ready to go. The new Osborne **Double Density Upgrade** option increases the diskette storage capacity of the Osborne 1 to 184K of data storage. It also allows automatic density recognition of selected other diskette formats such as the IBM PC (CP/M-86), DEC VT180, Xerox 820 and Cromemco single density. In addition, we're now including (at no charge) the UCSD P-System with each double density option, allowing you to run almost any software created with UCSD P-System that is in the universal P-System diskette format.

The charge for the upgrade is \$185.00 for machines purchased after September 15, 1982 (serial numbers higher than NA211594 or CA112438 you'll find the number on the AC power plate on the rear of the computer) plus dealer installation. Machines purchased before September 15, 1982 will be returned to the OCC Hayward factory for upgrading, at a cost of \$295.00,

which includes installation. (Some dealers may opt to install double density on these machines, also, but must send a representative to Hayward for training before doing so).

### Roamin' Columns

The Osborne **80 Plus Column Option** adds a piggyback board to the existing Osborne 1 logic board, which provides screen widths of 52, 80 or 104 columns. The various screen widths are software selectable through the revised CP/M SETUP program included. The **80 Plus Column Option** also includes a composite video connector with RCA plug, enabling direct connection between the Osborne computer and an external monitor, eliminating the need for a monitor adaptor.

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Price of the **80 Plus Column Option** is \$185.00, if ordered prior to January 30th; \$250.00 afterwards. Dealer installation is extra. NOTE: The **80 Plus Column Option** can be installed by your dealer, or at the same time the Double Density Option is installed at the factory (at no additional installation charge).

### Interface Kit Available for Olivetti Typewriters

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### Getting Started

A quick self-instruction system has been developed by OCC for the Osborne 1 which helps you put the computer to work quickly and easily. **START-PAC** covers the basics of the Osborne's CP/M operating system, WordStar and SuperCalc.



purpose? In fact, it's very possible that you'll want many versions of CP/M, each stored on a different diskette, and each to be used for a different purpose. For example, if you have two printers, one a high-speed dot matrix printer (we'll assume it's connected to the IEEE-488 port), and the other a much slower, letter quality printer (assume it's tied to the serial RS-232 port), you might want to keep a separate WordStar diskette for each. The first diskette might be set up for the IEEE-488 or the Centronics protocol, and you would use it to put rough drafts out in a hurry on the dot matrix printer. The second WordStar diskette might be set up for the standard serial option, the ETX/AKN, or the XON/XOFF protocol, and used when you need material in final form.

For details on using the program "SETUP" see the section entitled "Setting Up" in chapter two of the blue Osborne Users Reference Guide. SETUP reads the CP/M operating system from the first three tracks of one of your diskettes and stores it temporarily in the Osborne's memory. SETUP then helps you to modify the stored copy of your CP/M system by having you answer a few questions. Finally, SETUP allows you to save your modified version of CP/M

on the system tracks of a diskette in either drive. SETUP can also be used simply to copy a CP/M system from one diskette to another.

Although SETUP handles all of the modifications to CP/M that most users will ever need, there will always be a few of us who aren't satisfied. For those who want to implement special features—the oddball printer, a null on one of the special function keys, or any of a number of other special features—the programs MOVCPM and SYSGEN are very helpful.

MOVCPM allows us to create new versions of CP/M that are designed to run in different parts of the machine's memory. SYSGEN is used to move the CP/M program from the system tracks of a diskette into the computer's memory. While the program is stored temporarily in the computer's memory, you can modify CP/M directly using a program called DDT that is found on your CP/M Utilities diskette. You can then use SYSGEN to send the modified CP/M to the system tracks of one or more diskettes. This sort of modification generally requires a little knowledge about assembly language programming, so don't feel bad if you get a bit lost in your first attempts. On the other hand

don't be afraid to jump in and try using these programs. Just BE SURE YOU ARE USING ONLY BACKUP DISKS THAT YOU CAN AFFORD TO LOSE. It's very easy to accidentally erase a disk when playing with assembly language, even for the experienced assembly language programmer.

For more details on these programs see Chapter 8, "Revisiting CP/M," of your *Users Reference Guide*. You might also look at the manuals put out by Digital Research Corporation on CP/M. These can be very helpful when trying to piece together your own personal version of CP/M, but they aren't written for beginners.

I hope this article has helped to clarify some of the mysteries surrounding CP/M. Remember that SETUP should handle almost any changes you want to make to your operating system, but don't be afraid to play with programs like SYSGEN, DDT, and MOVCPM. As long as you work with backup copies of your diskette, the risk is minimal.



(John Gaudio is the President of the Denver Osborne User's Group (DOG)).



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## new Products

### All You Need to Learn

MICRO Instructional, Inc., has created three, one hour audio instructional cassette tapes for the newcomer to the Osborne 1. Written in "plain language," this instructional series includes introductions to WordStar, CP/M and SuperCalc. The series consists of condensed versions of the User Manual supplied with the Osborne 1 computer.

The instructional tapes permit first-time users to gain confidence with the hardware "within the first hour or two of setup." Tapes will also be available for software in the areas of business applications for word and number processing, accounting packages, database management systems and other business-related programs. Each audio cassette is priced at under \$40.00 and tapes are also available for other brands of computers.

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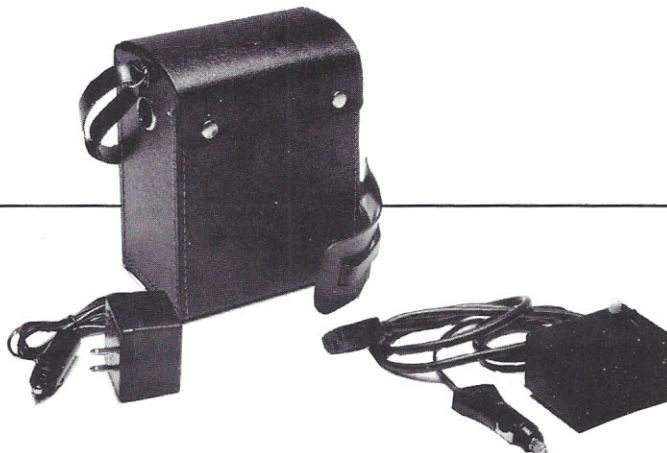
### Holiday Special

The Osborne Approved Software Team has developed a unique software bundle for the holiday season. Called WORD-PAC, it includes five software packages designed to enhance your word processing applications with WordStar. WORD-PAC retails for the special holiday price of \$295, and includes:

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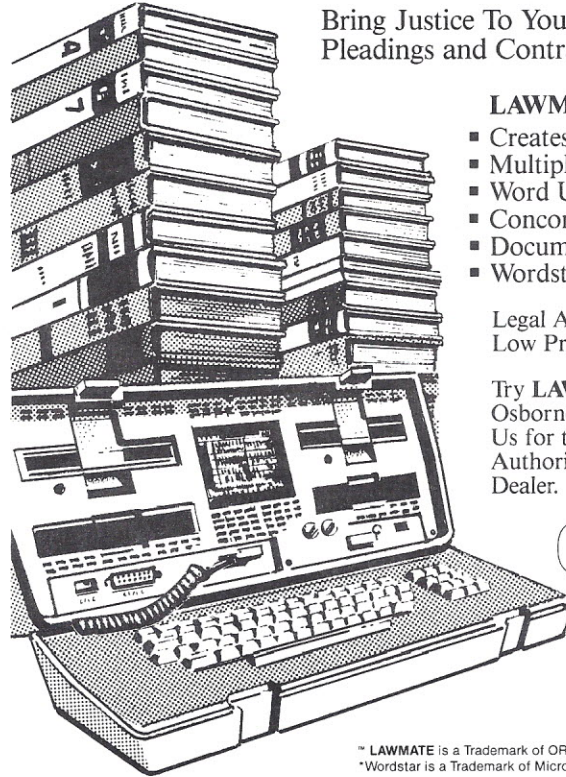
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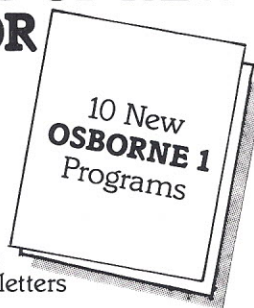
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*dBASICS*

## A gift from a micro to a user

### *Travel expense records with dBASE II*

David Gute

Recently, I was approached by someone at Osborne and asked to test out a data base software package called dBASE II. After accepting the offer, I put the package on a back burner and dove back into my daily projects. One idle evening, I decided to bring the package home and play around with it. That was the night I stumbled upon the gift from my micro.

I sat down with dBASE II and all my preconceived ideas of what a data base was. Thinking I would be able to use them with slight modifications, I rumaged through some of the old

forms I had designed with other data base packages. After a glance through the dBASE II documentation I immediately found that this was not an ordinary micro data base package, but a mainframe data base that would run on a microcomputer. The possibilities were endless.

Coming from a mainframe environment, this discovery sent me straight to heaven. Each turn of a page left me astounded. I broke out my Osborne and went straight to work. Around 3:00 a.m., my wife came out rubbing her eyes and asked if I was coming to bed. This is the

kind of enthusiasm dBASE II generates in any user who is tired of the limitations inherent in the average micro data base package.

A few days later, I began to consider the first-time user and the problems that might be encountered during indoctrination to dBASE II. The solution, I felt, was to break the stigma of "programming" by taking the user through an application broken down to the simplest level. As a result of all these ruminations, this column was born.

This first offering begins with a  
*continued on page 82*

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InfoWorld Software Report Card				
JRT Pascal Version 2.0				
	Poor	Fair	Good	Excellent
Performance	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Documentation	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Ease of Use	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Error Handling	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

From INFOWORLD magazine, August 16, 1982

"...JRT Pascal is following the example set by Software Toolworks (Sherman Oaks, CA) of offering quality software at extremely low price. It will be interesting to see if the trend continues..." Oct. '82, INTERFACE AGE.

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\*CP/M is a Digital Research TM. A 56K CP/M system is required.



Employee number	EMP:NO
Employee name	EMP:NAME
Travelers check sequence	TCHECK:NUM
Total amount of travelers checks advanced	TC:ADVANCE
Date issued	DATE:TC
Accounts payable check number issued	AP:ADVNO
Amount of issue	AP:ADV
Date issued	DATE:ADV
Petty cash	PETTY:CASH
Date petty cash issued	DATE:PETTY
Prepaid amount	PREPAID
Total expenses incurred on a trip	TOT:EXPEN

Table 1

simple menu driven routine. Each future column will build another command file, using different features; the object being to enable even the greenest user to construct and execute a working data base built with dBASE II.

Command files are written in

dBASE II in order to access data in a specific manner, which is defined by the user. It is essentially a way of custom-designing the method in which the data base is to be applied. If designed properly, a person who has never looked at dBASE II before will be able to sit down—issue one

command—and perform a specific operation such as data entry, data edit, running a report, etc.

Before writing a command file, the user must have an objective and a data base structure. The objective for the following program was to create a simple data entry routine for travel expense information.

#### Advances Possible

- \* Travelers checks
- \* Accounts payable
- \* Petty cash
- \* Prepaid expenses

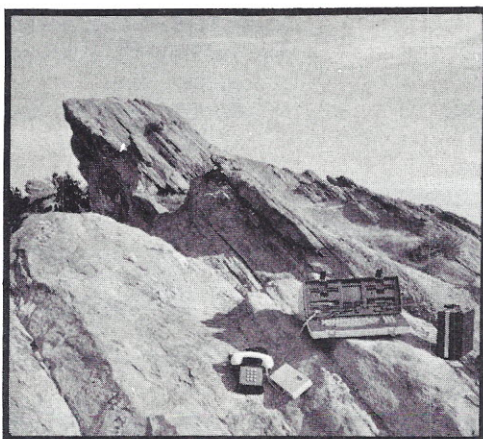
FLD	NAME	TYPE	WIDTH	DEC
001	EMP:NO	C	006	
002	EMP:NAME	C	025	
003	TCHECK:NUM	C	015	
004	TC:ADVANCE	N	008	002
005	DATE:TC	C	008	
006	AP:ADVNO	C	008	
007	AP:ADV	N	008	002
008	DATE:ADV	C	008	
009	PETTY:CASH	N	008	002
010	DATE:PETTY	C	008	
01	PREPAID	N	008	002
012	TOT:EXPEN	N	008	002

Table 2

Now that an objective has been established, it is necessary to define the data base. A data base includes data name, type of data (C-Character, N-Numeric and L-Logical), width (size of data field) and decimal places. A complete data base for travel expenses would look something like Table 1. Table 2 shows the structure for the data base.

The menu in Figure 1 gives the operator two options: enter data or quit. All instructions necessary to enter data are given, without the reader having to reference the dBASE II manual.

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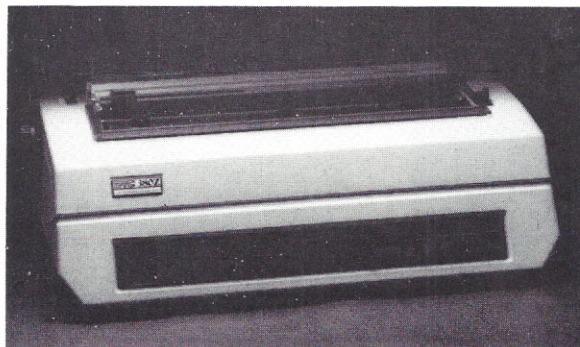
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*the  
Processed Word*

# WordStar Changes

Thom Hogan

Now that WordStar 3.0 is available to Osborne 1 owners through the upgrade diskette, many of you probably are interested in knowing the "magic" locations that allow you to customize your copy of WordStar.

Magic changes, you ask? What do I mean by magic changes?

Let's take my own case, for instance. I've used WordStar from its first appearance on the marketplace, and I no longer need any of the help messages it presents. Therefore, my version of WordStar starts with Help level 2, not 3. I also don't like to edit with the Insert mode ON, since this usually results in "garbage" characters appearing in front of my cursor, so I have customized my version of WordStar to start with Insert OFF.

Most of the things that you can change or specify during editing can be modified so that they are set to your preferences when WordStar first loads into memory and presents its sign-on message.

### How to Do It

You'll need a copy of your WordStar diskette to play with (never use an original to make changes), your CP/M Utility diskette, and this article. Put your WordStar diskette in Drive B, your CP/M Utility diskette in Drive A (when you get double density, you will only need a WordStar diskette in Drive A, since the INSTALL program we're about to use is

on the double density WordStar, you don't need the CP/M Utility).

Press RESET and then press RETURN to start the computer. When you see the CP/M A > prompt, type INSTALL and press RETURN. The INSTALL program identifies itself to you and asks if you want "a normal installation." You don't, so press N for "no." When you are presented with the choices available (A-D), press D, and then, in response to the name of the file to use, type:

**B:WS.COM**

then press RETURN.

INSTALL first takes you through a series of routine questions: what kind of terminal do you have, what kind of printer, how is the printer connected, etc. Unless you're just now getting around to specifying what printer you have, reply to each of the four questions first with a U, for no change, then with a Y to confirm that you want no change. If you're doing everything right, so far you've typed the following:

INSTALL <cr>

N

D

B:WS.COM <cr>

U Y

U Y

U Y

Now INSTALL is asking you if all the changes have been made. Press N, for



The program looks like this:

1-This command erases the screen. Now, only what you want to be seen will be displayed.

2-Setting escape on does just what it says. It gives you a method of escaping from the program in the event your program does not work as expected (you get stuck in a loop). With escape on you can hit the escape button and be brought back to the dBASE II prompt “.”.

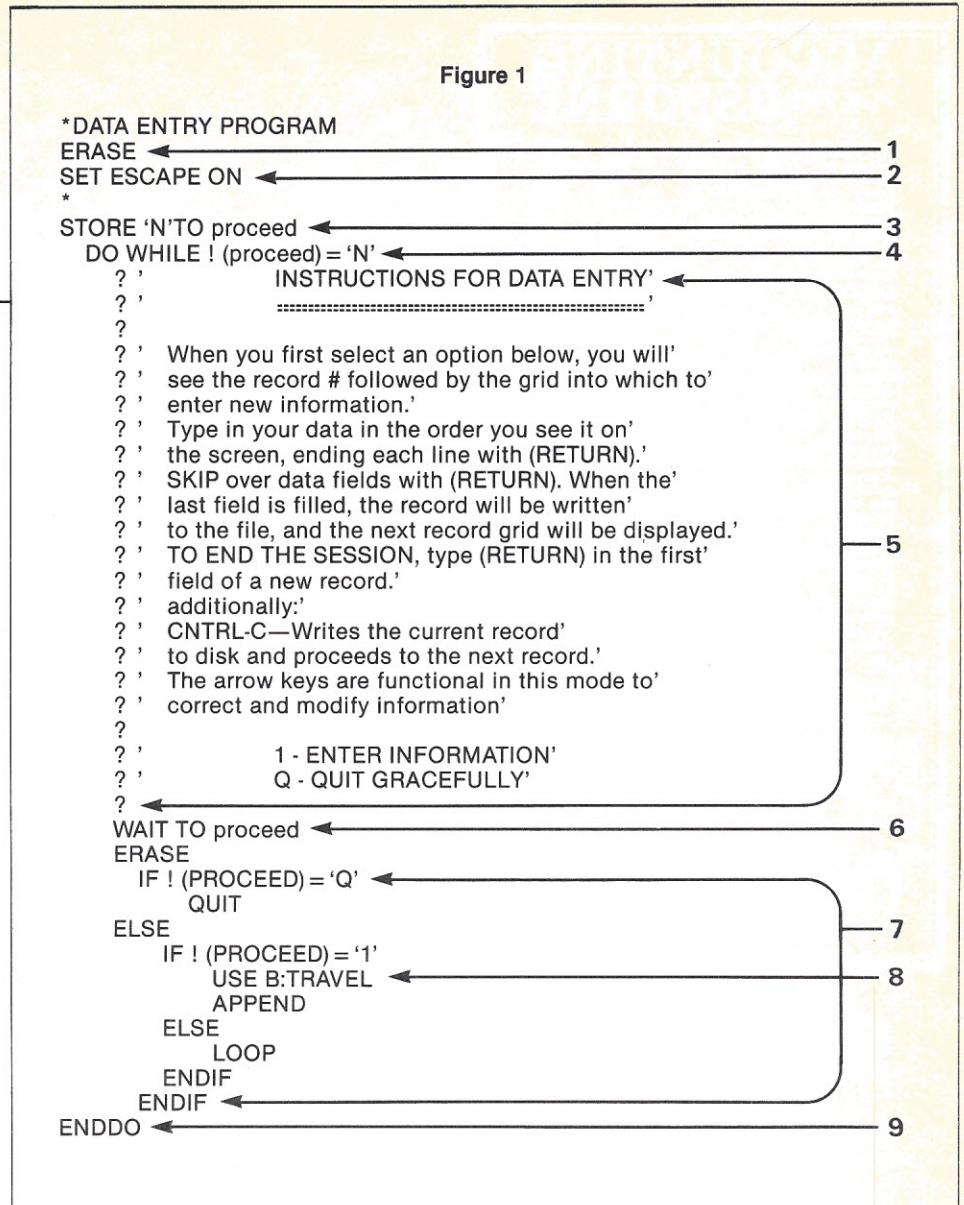
3-Setting a “switch” is an important feature of dBASE II. You can think of this as a light switch, either on or off. In this statement the switch is on as long as “N” is stored in the memory variable “proceed”.

4-WOW. Just look at this command. Exclamation point, parenthesis and everything. simple enough...DO WHILE says it is going to do everything that follows until it's ENDDO is encountered, as long as the switch is on (proceed = “N”). By putting a parenthesis around the memory variable “proceed” and putting an exclamation in front of it, we told dBASE II to convert anything entered into uppercase. Later we will give the operator an opportunity to change the value stored in “proceed”. We no longer have to worry about entering a lowercase letter.

5-Instructions to the operator. This should tell the operator all the commands that might be used by him or her. It gives a brief description of how to execute a command and what the command will do. Now the operator does not have to break out the manual or spend hours learning the package. The operator can sit down and start working by reading the screen and selecting the option “ENTER INFORMATION”.

6-WAIT TO proceed. Wait until the operator enters a key stroke. dBASE takes the character entered and stores it in memory variable “proceed”.

7-If the value entered is “Q” the program quits “gracefully”. In other words, the QUIT command is issued. This closes the file in use and returns



you to CP/M. This assures you that the QUIT command is issued without the opportunity to forget. Forgetting this command could destroy all the data in the data base. Another justification for a program-driven menu!

If 'I' is entered, the APPEND command is issued and you can start entering data.

8-USE opens the DATA BASE called “TRAVEL” located on Drive B.

If anything else is entered the program will loop back to the menu and force the operator to enter either “Q” or “I”.

9- Ends the list of commands that fall within the DO WHILE loop.

Now you name this bit of code. I'll call this ENTRY.CMD (it must have a CMD extension). Store this file on the A drive, along with dBASE II. Put your data disk in Drive B. At

dBASE II prompt “.” your operator enters the command “DO ENTRY” and it's running. That's all there is to it! Your first program in dBASE II. Not very intimidating and it actually does something useful. This should be enough to get started with. Now it's up to you to experiment on your own. You can start by adding dBASE option 2 to your menu, with the EDIT command. The powers of dBASE II go on and on. The only limits are in your own imagination.

Sit back with your Osborne and learn to speak dBASE II. You'll be glad you did.

*(dBASE II is licensed from and the trademark of Ashton-Tate, Inc.)  
(Dave Gute is a senior technical Sysgen analyst at Braegen Corporation.)*





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Card # \_\_\_\_\_

Expiration Date \_\_\_\_\_

Authorized Signature \_\_\_\_\_

### WordStar 3.0 Internal Labels

In the following chart, a value of 00 means OFF, a value of FF means ON.  
(WordStar 2.26 addresses in parenthesis where different)

LABEL NAME	ADDRESS	DEFAULT VALUE	EXPLANATION
ITHELP:	0360	02	Initial HELP level (00-03)
NITHLF:	0361	00	Displays "for Maximum HELP message
ITITOG:	0362	00	Insert Mode
ITDSDR:	0363	FF	Directory Display
INITPF:	0366	08	Line height (in 1/48's)
	0367	42	Paper length (lines)
	0368	02 10	Paper length (in 1/48's)
	036A	08	Line height repeated here
	036B	03	Top margin (in lines)
	036C	00 18	Top margin (in 1/48's)
	036E	08	Line height repeated again
	036F	02	Heading margin (in lines)
	0370	00 10	Heading margin (in 1/48's)
	0372	08	Line height repeated again
	0373	08	Bottom margin (in lines)
	0374	00 40	Bottom margin (in 1/48's)
	0376	08	Line height repeated again
	0377	02	Footing margin (in lines)
	0378	00 10	Footing margin (in 1/48's)
	037A	08	Line height repeated again
	037B	00	Must be 0 for standard char width
	037C	0C	Standard char width (1/120's)
	037D	0A	Alternate char width (1/120's)
	037E	08	Page offset in characters
INITLM:	037F	00	Left margin minus 1
INITRM:	0380	32	Right margin minus 1
INITSR:	0381	03	Superscript roll (in 1/48's)
INITWF:	0385	FF	Word Wrap (^OW)
	0386	FF	Justification (^OJ)
	0387	FF	Variable tabs (^OV)
	0388	00	Soft Hyphen Entry (^OE)
	0389	FF	Stop to Hyphenate ^B com- mands
	038A	FF	Control Character Display (^OD)
	038B	FF	Ruler Display (^OT)
	038C	FF	Dynamic Page Break
	038D	FF	Show Page Breaks (^OP)
	038E	01	Line Spacing (1-5)
	038F(NA)	00	Block Move (^KN)
NONDOC:	0392(0391)	00	Enter WS in Non-Documen- t Mode
DECCHR:	0393(0392)	2E	Decimal tab character (period)
DOTCHR:	0395(0394)	2E	DOT command character (period)
DOTSON:	0397(0396)	FF	Enable Dynamic DOT com- mand interpretation
PODBLK:	03CA	00	Disk File Output from print
	03CB	00	User Form Feeds during print
	03CC	00	Suppress page format during print
	03CD	00	Pause between pages during print
ITPOPN:	03D3	00	Omit page numbers during print

no. INSTALL now prompts:

YOU MAY NOW MODIFY ANY LOCATION DESCRIBED IN THE LISTING AT THE END OF THE USER MANUAL OR THE CUSTOMIZATION NOTES. YOU MAY USE EITHER THE LABEL OR THE HEX ADDRESS TO SPECIFY THE LOCATIONS YOU WISH TO CHANGE. IF YOU USE A LABEL THEN YOU MAY APPEND AN OFFSET TO THE LABEL (I.E. LABEL: +31). THE THE NEW VALUE ONLY AS A HEX NUMBER. A LOCATION OF ZERO (0) LOCATION TO BE CHANGED (0 = END):

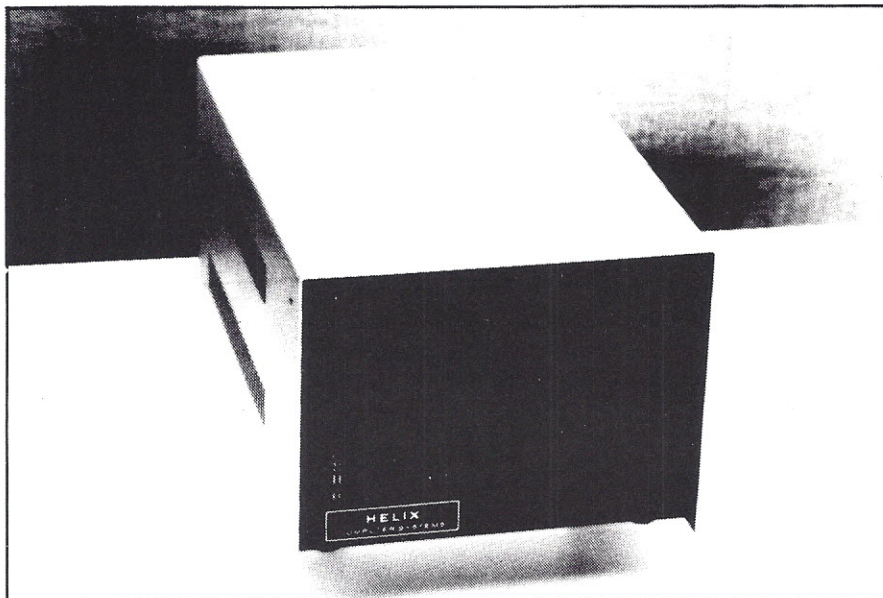
What you now wish to do is to type one of the LABELS from the accom-



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*Calc Aids*

## SuperCal-endar

### *Creating a Calendar in SuperCalc*

Manny Juan

Electronic spreadsheets are excellent tools for financial planning and accounting processes but they are quite capable of creating other things too—like a calendar. After all, you do need dates to prepare forecasting models.

In this worksheet, you only do two things: 1) enter the year and 2) press “!” (the “answer key”) and voila!—SuperCalc gives you a full calendar for that year. All the other cells eventually depend on the value of the year. The only cells that are constant, or fairly constant, are obviously the month names and the number of days in a month.

### How It Works

The creation of this worksheet derives from two ideas. The first is the old adage “Thirty days hath September...” and the second comes from a short cut routine used in a mental day-calculation trick found in Martin Gardner’s book, *Mathematical Carnival*. According to this idea, the starting day of the months of the year follow this pattern in non-leap years:

1, 4, 4, 0, 2, 5, 0, 3, 6, 1, 4, 6  
(During leap years, the pattern starts with “0, 3”).

Using a convention of 0 = Sunday, 1 = Monday, etc., the pattern may be interpreted this way: If January 1 falls on a Monday (1), February 1 and

March 1 would fall on a Thursday (4), and April 1, on a Sunday (1). For any given year, the values of this list may be displaced by any amount from 1 to 6 but the pattern remains the same. The displacement is actually the day of the week that December 31 (of the previous year) falls. If the offset values are then taken modulo 7, the resulting list defines the starting days of the months for the specific year.

This worksheet completes a month according to this scheme: The formulas for the days of the first week determine on what day of the week the month begins. Then the days of the next three weeks are filled up by simple counting. The last two weeks of the month are handled a little differently because the last day of the month may occur in any of these weeks. The formulas are coded so that days which would compute to less than 1 or greater than the number of days in a month, using simple counting, will show as zeroes.

### How to Enter the Worksheet

Rather than overwhelming you with pages and pages of “contents” listing from the worksheet, I am presenting you with a step by step process. I listed the contents output to disk and moved things around with WordStar so you can recreate the worksheet more easily. These steps are essentially the ones I used to



panying chart (like ITHelp: or ITITOG:, for instance), then press RETURN. When INSTALL shows you what the current contents of the LABEL are, type the contents you desire (again consulting the accompanying chart). If INSTALL doesn't recognize a LABEL you type, make sure that you included the colon (:) at the end. If INSTALL still doesn't recognize the LABEL (it won't for a few of the ones we've included), type the address indicated in the chart instead.

One problem for you newcomers is going to be that everything WordStar wants is to be entered in hexadecimal (base 16) arithmetic. Thus, if you want a left margin of 16, you'd enter 10 (hexadecimal) instead. If you have problems with this, consult the chart that accompanied the article on Hex and ASCII in the third issue of this magazine.

If an entry requires multiple characters (i.e., more than one number per LABEL), instead of entering a new label name, press RETURN for the second and subsequent characters. INSTALL presents the LABEL when you do that as:


**ITHelp: +0001**  
**ITHelp: +0002**


etc.


When you're done with your last entry, type 0 and press RETURN instead of typing a LABEL name. Save the file by replying Y to the next question.


So that you can follow the whole operation, we've turned on our printer and copied the information from the screen during a sample entry session, as described above.

*(We had originally intended to reprint these addresses for the 2.26 Version of WordStar, as submitted by Bob Van Cleef of the San Diego Osborne User's Group. Since 3.0 was just released, we have incorporated Mr. Van Cleef's material in this column and thank him for his input.)* □









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## *Calc Aids*

create the calendar.

The trick is to create one month first. I have written the formulas for one month such that almost all cell references are localized within the rectangular space occupied by the month. This makes it easier later to replicate blocks of code since SuperCalc will perform automatic adjustments of cell references.

First, set a format global setting of 4 for all widths by typing this command: /F,G,4

This will allow three months across to fit on a line printer width of 132 very nicely. Now enter the first five cells below. The cell A1 is where the 2-digit year will go. (The century is assumed to be 19. Let someone else worry about other centuries—I was born in this one.) Cell A2 determines if it is a leap year (value of 1) or not (zero). The number of day displacements since 1900 is put in A3 and this number, modulo 7 is placed into A4 as the "base date." The starting date of all months will be offset from this value—following the pattern described above.

A1 = 82  
B1 = "< == Enter 2 digit year here and hit !  
A2 = IF ((A1 - 4\*INT(A1/4))=0, 1,0)  
A3 = A1 + INT(A1/4)  
A4 = A3-7\*INT(A3/7)

At this point, we are ready to enter the month of January. Enter the cells shown below. The formula at F6 determines the starting day of January for the supplied year. (This formula is adjusted later to take care of leap years.)

A6 = " January  
F6 = (1 + A4) - 7\*INT((1 + A4)/7)  
G6 = 31  
A7 = " Sun Mon Tue Wed Thu  
Fri Sat

The following entries define the first week of the month. They determine where Day 1 goes based on the "base date" cell in A4. After you have entered B8 below, it may be

replicated into C8 through G8 by using this command:

/R,B8,C8:G8,A

The "A" option will allow you to select variables to adjust. When you are asked to adjust F6, reply "n".

A8 G = IF (1 - F6 < 1,0,1)  
B8 G = IF (AND(2 - F6 < 1, A8 < 1),0,A8 + 1)  
C8 G = IF (AND(3 - F6 < 1,B8 < 1),0,B8 + 1)  
D8 G = IF (AND(4 - F6 < 1,C8 < 1),0,C8 + 1)  
E8 G = IF (AND(5 - F6 < 1,D8 < 1),0,D8 + 1)  
F8 G = IF (AND(6 - F6 < 1,E8 < 1),0,E8 + 1)  
G8 G = IF (AND(7 - F6 < 1,F8 < 1),0,F8 + 1)

The following formulas solve the contents of the second week. After having entered B9, you may replicate it into C9 through G9, letting SuperCalc perform automatic adjustments.

A9 = G8 + 1  
B9 = A9 + 1  
C9 = B9 + 1  
D9 = C9 + 1  
E9 = D9 + 1  
F9 = E9 + 1  
G9 = F9 + 1

After having entered the above row, you may now replicate it for the next two weeks by typing the command:

/R,A9:G9,A10:A11

Do not use the Ask Adjust feature this time—just let SuperCalc perform all the transformations. Verify that the cells in these rows (10 and 11) match the contents below.

A10 = G9 + 1  
B10 = A10 + 1  
C10 = B10 + 1  
D10 = C10 + 1  
E10 = D10 + 1  
F10 = E10 + 1  
G10 = F10 + 1

A11 = G10 + 1  
B11 = A11 + 1  
C11 = B11 + 1  
D11 = C11 + 1  
E11 = D11 + 1



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# Calc Aids

F11 = E11+1  
G11 = F11+1

The next 7 formulas take care of the case where the last day of the month falls on the first day of the fifth week (like February in 1982).

A12 = IF (AND(G11 < G6, G11 > 0), G11 + 1, 0)  
B12 = IF (AND(A12 < G6, A12 > 0), A12 + 1, 0)

You may replicate B12 into C12 through G12 at this point, but again, you have to invoke the Ask Adjust feature. In this case, when you are asked to adjust G6, reply "n". For all

other variables, answer "y".

C12 = IF (AND(B12 < G6, B12 > 0), B12 + 1, 0)

D12 = IF (AND(C12 < G6, C12 > 0), C12 + 1, 0)

E12 = IF (AND(D12 < G6, D12 > 0), D12 + 1, 0)

F12 = IF (AND(E12 < G6, E12 > 0), E12 + 1, 0)

G12 = IF (AND(F12 < G6, F12 > 0), F12 + 1, 0)

Similarly, the above row may be replicated into row 13 with the command:

/R,A12:G12,A13,A

You also have to request the Ask Adjust feature (as shown above) to tell SuperCalc to keep G6 the same in the replication.

A13 = IF (AND(G12 < G6, G12 > 0), G12 + 1, 0)

B13 = IF (AND(A13 < G6, A13 > 0), A13 + 1, 0)

C13 = IF (AND(B13 < G6, B13 > 0), B13 + 1, 0)

D13 = IF (AND(C13 < G6, C13 > 0), C13 + 1, 0)

E13 = IF (AND(D13 < G6, D13 > 0), D13 + 1, 0)

F13 = IF (AND(E13 < G6, E13 > 0), E13 + 1, 0)

G13 = IF (AND(F13 < G6, F13 > 0), F13 + 1, 0)

Now type these two commands to create the next two months in the quarter. Don't worry about the unique values (like name of month, etc.) yet.

/R,A6:G13,K6,

/R,A6:G13,U6,

Are you ready for the rest of the year? Enter these next commands to create the second, third and fourth quarters.

/R,A6:AA13,A16,

/R,A6:AA13,A26,

/R,A6:AA13,A36,

## The Finishing Touches

Using the "=cell" command, go to the cells listed below and enter all the contents shown. The cells corresponding to A6, F6, and G6 all contain values related to January. You may want to set the global option to "M" at this point to get ready for the manual calculation mode.

A6 = "January"

K6 = "February"

U6 = "March"

A16 = "April"

K16 = "May"

U16 = "June"

A26 = "July"

K26 = "August"

U26 = "September"

A36 = "October"

K36 = "November"

U36 = "December"

1: A1: B1: C1: D1: E1: F1: G1: H1: I1: J1: K1: L1: M1: N1: O1: P1: Q1: R1: S1: T1: U1: V1: W1: X1: Y1: Z1: AA1:																											
11: B3 <== Enter 2 digit year here and hit !																											
21: 0																											
31: 103																											
41: 5																											
51:																											
61: January 6 31														February 2 28							March 2 31						
71: Sun Mon Tue Wed Thu Fri Sat							81: Sun Mon Tue Wed Thu Fri Sat							91: Sun Mon Tue Wed Thu Fri Sat													
81: 0 0 0 0 0 0 1							0 0 1 2 3 4 5							0 0 1 2 3 4 5													
91: 2 3 4 5 6 7 8							6 7 8 9 10 11 12							6 7 8 9 10 11 12													
101: 9 10 11 12 13 14 15							13 14 15 16 17 18 19							13 14 15 16 17 18 19													
111: 16 17 18 19 20 21 22							20 21 22 23 24 25 26							20 21 22 23 24 25 26													
121: 23 24 25 26 27 28 29							27 28 0 0 0 0 0							27 28 29 30 31 0 0													
131: 30 31 0 0 0 0 0							0 0 0 0 0 0 0							0 0 0 0 0 0 0													
141:																											
151:																											
161: April 5 30														May 0 31							June 3 30						
171: Sun Mon Tue Wed Thu Fri Sat							181: Sun Mon Tue Wed Thu Fri Sat							191: Sun Mon Tue Wed Thu Fri Sat													
181: 0 0 0 0 0 1 2							1 2 3 4 5 6 7							0 0 0 1 2 3 4													
191: 3 4 5 6 7 8 9							8 9 10 11 12 13 14							5 6 7 8 9 10 11													
201: 10 11 12 13 14 15 16							15 16 17 18 19 20 21							12 13 14 15 16 17 18													
211: 17 18 19 20 21 22 23							22 23 24 25 26 27 28							19 20 21 22 23 24 25													
221: 24 25 26 27 28 29 30							29 30 31 0 0 0 0							26 27 28 29 30 0 0													
231: 0 0 0 0 0 0 0							0 0 0 0 0 0 0							0 0 0 0 0 0 0													
241:																											
251:																											
261: July 5 31														August 1 31							September 4 30						
271: Sun Mon Tue Wed Thu Fri Sat							281: Sun Mon Tue Wed Thu Fri Sat							291: Sun Mon Tue Wed Thu Fri Sat													
281: 0 0 0 0 0 1 2							0 1 2 3 4 5 6							0 0 0 0 1 2 3													
291: 3 4 5 6 7 8 9							7 8 9 10 11 12 13							4 5 6 7 8 9 10													
301: 10 11 12 13 14 15 16							14 15 16 17 18 19 20							11 12 13 14 15 16 17													
311: 17 18 19 20 21 22 23							21 22 23 24 25 26 27							18 19 20 21 22 23 24													
321: 24 25 26 27 28 29 30							28 29 30 31 0 0 0							25 26 27 28 29 30 0													
331: 31 0 0 0 0 0 0							0 0 0 0 0 0 0							0 0 0 0 0 0 0													
341:																											
351:																											
361: October 6 31														November 2 30							December 4 31						
371: Sun Mon Tue Wed Thu Fri Sat							381: Sun Mon Tue Wed Thu Fri Sat							391: Sun Mon Tue Wed Thu Fri Sat													
381: 0 0 0 0 0 0 1							0 0 1 2 3 4 5							0 0 0 0 1 2 3													
391: 2 3 4 5 6 7 8							6 7 8 9 10 11 12							4 5 6 7 8 9 10													
401: 9 10 11 12 13 14 15							13 14 15 16 17 18 19							11 12 13 14 15 16 17													
411: 16 17 18 19 20 21 22							20 21 22 23 24 25 26							18 19 20 21 22 23 24													
421: 23 24 25 26 27 28 29							27 28 29 30 0 0 0							25 26 27 28 29 30 31													
431: 30 31 0 0 0 0 0							0 0 0 0 0 0 0							0 0 0 0 0 0 0													



# DYNACOMP

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**BRIDGE MASTER** Price: \$21.95 Diskette  
If you liked DYNACOMP'S BRIDGE 2.0, you will absolutely love BRIDGE MASTER. BRIDGE MASTER is a comprehensive bridge program designed to provide hours of challenging competition. Bidding features include the Blackwood convention, Stayman convention, pre-emptive openings, and recognition of demand bids and jump-shift responses. After playing a specific hand, you may replay the same hand, with the option of switching cards with your computer opponents. This feature allows you to compare your bidding and playing skills to BRIDGE MASTER. Bonuses for game contracts and slams are awarded as in duplicate bridge. Doubled contracts are scored based upon a computer assigned vulnerability. A score card is displayed at the conclusion of each hand. The score card displays a summary of total hands played, total points scored, number of contracts made and set, and % bids made. BRIDGE MASTER is clearly the best computer bridge program available. DYNACOMP'S previous BRIDGE 2.0 customers may upgrade to BRIDGE MASTER for a nominal charge of \$5.00 plus postage and handling (see ordering information box).

**POKER PARTY** \$23.95 Diskette  
POKER PARTY is a draw poker simulation based on the book, POKER, by Oswald Jacoby. This is the most comprehensive version available for microcomputers. The party consists of yourself and six other (computer) players. Each of these players (you will get to know them) has a different personality in the form of a varying propensity to bluff or fold under pressure. Practice with POKER PARTY before going to that expensive game tonight! Apple cassette and diskette versions require a 32K (or larger) Apple II.

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This program is both an excellent teaching tool as well as a stimulating intellectual game. Based upon similar games played at graduate business schools, each player or team controls a company which manufactures three products. Each player attempts to outperform his competitors by setting selling prices, production volumes, marketing and design expenditures, etc. The most successful firm is the one with the highest stock price when the simulation ends.

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**VALDEZ** \$21.95 Diskette  
VALDEZ is a computer simulation of supertanker navigation in the Prince William Sound/Valdez Narrows region of Alaska. Included in this simulation is a realistic and extensive 256 x 256 element map, portions of which may be viewed using the ship's alphanumeric radar display. The motion of the ship itself is accurately modeled mathematically. The simulation also contains a model for the tidal patterns in the region, as well as other traffic (outgoing tankers and drifting icebergs). Chart your course from the Gulf of Alaska to Valdez Harbor! See the software reviews in 80 Software Critique and Personal Computing.

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This program tests your backgammon skills and will also improve your game. A human can compete against a computer or against another human. The computer can even play against itself. Either the human or the computer can double or generate dice rolls. Board positions can be created or saved for replay. BACKGAMMON 2.0 plays in accordance with the official rules of backgammon and is sure to provide many fascinating sessions of backgammon play.

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GO FISH is a classic children's card game. The opponent is a friendly computer with user inputs that are simple enough for small children to easily master. A must for children!

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**GAMES PACK I** \$18.95 Diskette  
GAMES PACK I contains the classic computer games of BLACKJACK, LUNAR LANDER, CRAPS, HORSESHOE, SWITCH and more. These games have been combined into one large program for ease in loading. They are immediately accessed by a convenient menu. This collection is worth the price just for the DYNACOMP version of BLACKJACK.

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GAMES PACK II includes the games CRAZY EIGHTS, JOTTO, ACEY-DUCEY, LIFE, WUMPUIS and others. As with GAMES PACK I, all the games are loaded as one program and are called from a menu. You will particularly enjoy DYNACOMP's version of CRAZY EIGHTS.

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TEACHERS' AIDE consists of three basic modules contained in one program. The first module provides addition and subtraction exercises of varying levels of difficulty. The second module consists of multiplication problems in which the student may be tested both on the final answer and/or on the subtotal answers in the long hand procedure. Several levels of complexity are provided here as well. The third module consists of division problems; one particularly nice feature of the division module is that the long hand division steps can be displayed along with the remainder in order to clearly demonstrate the procedure by which the remainder is derived. Using TEACHERS' AIDE is not merely a drill, but rather a learning experience.

### STATISTICS and ENGINEERING

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DIGITAL FILTER is a comprehensive data processing program which permits the user to design his own filter function or choose from a menu of filter forms. In the explicit design mode the shape of the frequency transfer function is specified by directly entering points along the desired filter curve. In the menu mode, ideal low pass, high pass and bandpass filters may be approximated to varying degrees according to the number of points used in the calculation. These filters may optionally also be smoothed with a Hanning function. In addition, multi-stage Butterworth filters may be selected. Features of DIGITAL FILTER include plotting of the data before and after filtering, as well as display of the chosen filter functions. Also included are convenient data storage, retrieval and editing procedures.

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**TFA (Transfer Function Analyzer)** \$23.95 Diskette  
This is a special software package which may be used to evaluate the transfer functions of systems such as hi-fi amplifiers and filters by examining their response to pulsed inputs. TFA is a major modification of FOURIER ANALYZER and contains an engineering-oriented decibel versus log-frequency plot as well as data editing features. Whereas FOURIER ANALYZER is designed for educational and scientific use, TFA is an engineering tool. Available for all computers.

**HARMONIC ANALYZER** \$28.95 Diskette  
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FOURIER ANALYZER, TFA and HARMONIC ANALYZER may be purchased together for a combined price of \$51.95 (three cassettes) and \$63.95 (three diskettes).

**REGRESSION I** \$23.95 Diskette  
REGRESSION I is a unique and exceptionally versatile one-dimensional least squares "polynomial" curve fitting program. Features include very high accuracy; an automatic degree determination option; an extensive internal library of fitting functions; data editing; automatic data, curve and residual plotting; a statistical analysis (eg: standard deviation, correlation coefficient, etc.) and much more. In addition, new fits may be tried without reentering the data. REGRESSION I is certainly the current one program in any data analysis software library.

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PARAFIT is designed to handle those cases in which the parameters are imbedded (possibly nonlinearly) in the fitting function. The user simply inserts the functional form, including the parameters (A11, A21, etc.) as one or more BASIC statement lines. Data, results and residuals may be manipulated and plotted as with REGRESSION I. The REGRESSION I for polynomial fitting, and PARAFIT for those complicated functions.

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Because the texts are a vital part of the documentation, BASIC SCIENTIFIC SUBROUTINES, Volumes 1 and 2 are available from DYNACOMP.

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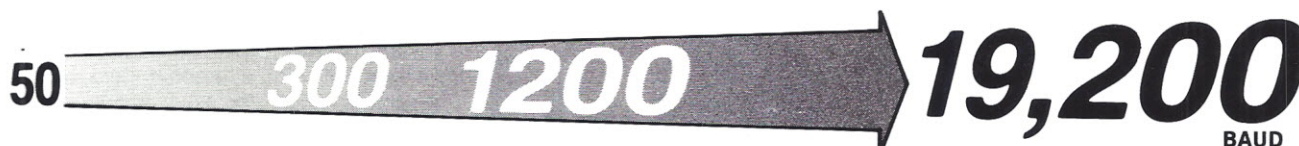
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Be especially careful in entering the following formulas. The best way to do it is to go to the specified cell, invoke the Edit command by typing "/E" and make your changes to the model formula replicated from January. Note that the integers follow the pattern described earlier in this article. The extra terms in the formulas for January and February take care of leap years.

F6 = (1 - A2 + A4) - 7\*INT((1 - A2 + A4)/7)  
P6 = (4 - A2 + A4) - 7\*INT((4 - A2 + A4)/7)  
Z6 = (4 + A4) - 7\*INT((4 + A4)/7)  
F16 = (0 + A4) - 7\*INT((0 + A4)/7)  
P16 = (2 + A4) - 7\*INT((2 + A4)/7)  
Z16 = (5 + A4) - 7\*INT((5 + A4)/7)  
F26 = (0 + A4) - 7\*INT((0 + A4)/7)  
P26 = (3 + A4) - 7\*INT((3 + A4)/7)  
Z26 = (6 + A4) - 7\*INT((6 + A4)/7)  
F36 = (1 + A4) - 7\*INT((1 + A4)/7)  
P36 = (4 + A4) - 7\*INT((4 + A4)/7)  
Z36 = (6 + A4) - 7\*INT((6 + A4)/7)

G6 = 31  
Q6 = 28 + A2  
AA6 = 31  
G16 = 30  
Q16 = 31  
AA16 = 30  
G26 = 31  
Q26 = 31  
AA26 = 30  
G36 = 31  
Q36 = 30  
AA36 = 31

If you had entered all values correctly you should now have a working calendar. Go to cell A1 and enter the year of your choice. Then press "I".

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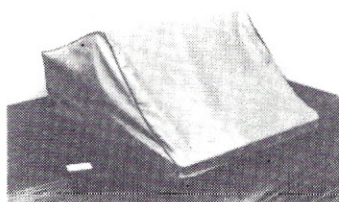
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*Whoops*

# Software update pac available

Table 1 lists the current revision numbers for all the software packages that Osborne currently is shipping ("currently" means 18 October 1982, the date this is written).

By the time you read this in early December, the Update-PAC should be available from your local dealer. Included in the Update-PAC are:

SuperCalc 1.12  
 WordStar 3.0  
 MailMerge 3.0  
 CBASIC 2.07  
 new AUTOSTs and new HELP

The price for this update is \$75, and includes documentation on the differences.

Under the Approved Software program, a bulletin telling you how to modify your copy of Disk Doctor is available to registered owners of serial numbers 1-1500 of Disk Doctor. This bulletin was mailed to all registered Disk Doctor owners in early November. The problem with Disk Doctor is deemed minor, only affecting users who are trying to restore track 0 on a diskette, and the change can be performed by any reasonably competent computer user.

Also in early November, owners of Spellguard received a letter from Osborne describing how to send in their diskettes for replacement. This is not an upgrade as described in the last issue of this magazine, i.e., there

is no charge for the diskette swap.

The problem exhibited by Spellguard can be seen in one of two ways: either the MAINTAIN file refuses to function because it thinks Spellguard has errors, or, under unusual circumstances, you may make a modification to the dictionary that Spellguard never stores. The problem turns out to be related to the early implementations of CP/M that Osborne shipped, not Spellguard's problem, thus Osborne will pay for the update. All Spellguards purchased before September 1st, 1982, should be sent back for correction.


If you own a copy of Spellguard purchased before October, 1982, and did not receive a letter from us in November, check with your local dealer for details.

*As We Go To Press:*

*Micro Pro International informed us, just as we went to press, that WordStar 3.4 is to become available soon. Accordingly, we have temporarily postponed the availability of Software Upgrade package so we can provide version 3.4 instead of the anticipated 3.0 version. Most of the internal address' and modification notes we publish in this issue (The Processed Word) should remain the same with 3.4: others will be published later. We will announce the availability of the 3.4 version in the earliest possible issue. —th*



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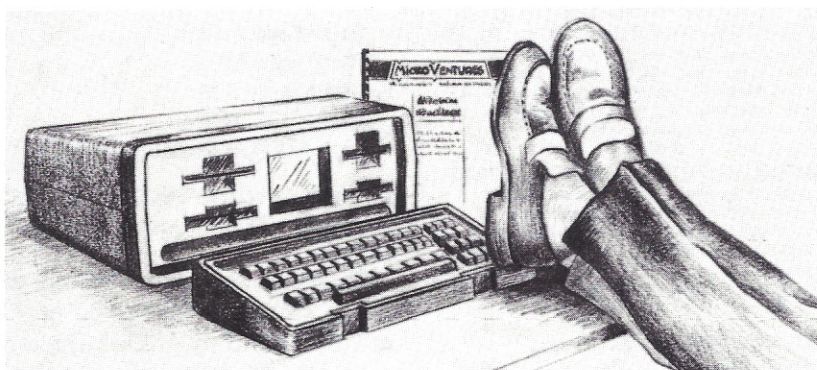
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next  
time

The next issue of *The Portable Companion* focuses on the ever pertinent world of word processing. We'll be looking at how to tie in with the typesetter, a note-keeping system for inventive writers and lots of tips on how to simplify your overall idea processing techniques. We'll take a philosophical look at composing via computer and spell out a few short cuts for the academic user.

Puzzler will return with a fresh new slant and some long awaited answers.

Tune in next time for all the details.

**Disclaimer:** Osborne Computer Corporation does not endorse products that are advertised in this publication, nor are the claims in the advertisements checked for misrepresentations or misleading information. All specifications listed for advertised products are those of the advertiser, not of Osborne Computer Corporation. As always, be careful when deciding which items you want to purchase.

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**Table 1**  
Current Software Revision Numbers

Name	Number	Notes
<hr/>		
System Software:		
System ROM	1.4	Differences between 1.3 and 1.4 concern double density; if you buy double density you'll get ROM 1.4.
CP/M	2.2	
SuperCalc	1.05	Version 1.12 available to current owners through Update PAC.
WordStar	2.26	Version 3.05 available to current owners through Update PAC.
MailMerge	2.26	Version 3.0 available to current owners through Update PAC.
CBASIC	2.06	Version 2.07 available to current owners through Update PAC.
MBASIC	5.21	
<hr/>		
Approved Software:		
BASCOM	5.30	
DataStar	1.101	Release 1.4 to be made in early 1983.
dBASE II	2.3B	Release 2.31B to be made in early 1983. Includes ZIP.
Documate/Plus	1.30	
Disk Doctor	1.40	Modification bulletin available upon request.
Enumerator	1.01	
Footnote	2.20	
Forth	2.00	Release 3.0 to be made late 1982.
Grammatik	1.82	
Mailman	2.00	
Micro Link	2.3	Micro Link II is only available from Digital Marketing.
Milestone	1.09	
Money Maestro	1.64	
Math*	3.043	
MuMath	2.14	
Datebook	1.00	
Spellguard	2.00	Corrected version now available
SuperSort	1.5	Release 1.6 to be available in early 1983.

The **First Osborne Group (F O G)** has been formed as a Users' Group for persons using or interested in Osborne Computers and the CP/M Disk Operating System with related Software. Membership is available to any interested party whether or not they currently own an Osborne Computer. **F O G**, the **FOGHORN**, and the diskette library are all supported by volunteer contributions of time, money, and software from all active **F O G** members. Guests are welcome at our meetings at any time (as long as they do not participate in Piracy or copying of Proprietary software), but dues of \$24.00/yr in U.S. or \$30.00/yr elsewhere are required in order to receive the **FOGHORN**, have access to the diskette Library, or derive other available benefits.



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Send the completed application and your payment to: **First Osborne Group (F O G)**, P. O. BOX 11683-A, Palo Alto, CA 94306



# Sources

The following is a list of remote CP/M (RCP/M) bulletin board systems (24hr).  
For a complete list of bulletin board systems see *Microcomputing*, July 1982.

RCP/M RBBS San Diego, CA	(714) 273-4354
RCP/M CBBS Pasadena, CA	(213) 799-1632
RCP/M RBBS MUG, Mission, KS	(913) 362-9583
RCP/M RBBS Hyde Park, IL	(312) 955-4493
RCP/M Logan Square, Chicago, IL	(312) 252-2136
RCP/M RBBS Allentown, PA	(215) 398-3937
RCP/M Beaverton, OR	(503) 641-7276
RCP/M MCBBS TCBBS Dearborn, MI	(313) 846-6127
RCP/M Flanders, NY	(201) 584-9227
RCP/M RBBS Rochester, NY	(716) 223-1100
RCP/M Mississauga, Ontario, CANADA	(416) 826-5394
RCP/M CBBS CP/M Net Simi Valley, CA	(805) 527-9321*
RCP/M McLean, VA	(703) 524-2549
RCP/M RBBS Southfield, MI	(313) 559-5326
RCP/M CBBS Columbus, OH	(614) 272-2227
RCP/M RBBS Arvada Elect., Co. Springs, CO.	(303) 634-1158
OXGATE, Mountain View, CA	(415) 964-4097
OXGATE, Milpitas, CA	(408) 263-2588

\*Not a 24 hour system; 7-11 pm weekdays, 24 hr weekends.



### **System Checker™**

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### **SuperSort™**

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### **Grammatik™**

Grammatik provides the Osborne user with a unique program that analyzes written styles at both the word and the sentence level. This document-checking system checks for two sources of potential problems; style and typographical errors. Style analysis includes checks for specific phrases commonly recognized as being poor or wordy usage, as well as compiling statistics about word and sentence length. Typographical checking detects a number of errors such as: double words, capitalization at the beginning of sentences, and inconsistent and punctuation marks. (*Aspen Software Company™*)

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### **Microsoft® Basic Compiler**

Allows Osborne users to compile their MBasic interpretive programs into true Z80 machine code. The Basic Compiler provides you with three major benefits: 1) increased speed of execution for most programs; 2) decreased program size for extremely large programs, and 3) source code security. When you distribute a compiled program, you distribute optimized machine code, not source code. Consequently, you distribute your program in very compact form and protect your source program from unauthorized alteration. The package also included a relocatable Z80/8080 assembler for use under CP/M. (*Microsoft™*)

### **Mailman™**

Mailman creates and manages your mailing list. Formatted screen entry with eight different selecting criteria gives the Osborne user ease of access and entry, along with discrete listing capabilities. In addition, the program automatically sorts data by zip code and name. Mailman is designed to work with WordStar and MailMerge®. (*Standard Microsystems™*)

### **BSTAM™**

BSTAM is a telecommunications program that allows the Osborne user to send and receive any CP/M file with complete error checking. The BSTAM documentation gives the user a comprehensive overview of types of channels, modes of transmission, sending and receiving any CP/M file. A copy of BSTAM is required on both systems involved in the communication. (*Byrom Software™*)

### **Real Estate Investor Calc-aid™**

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### **Documate/Plus™**

This is an indexing program that works with WordStar to create an automatic text index or table of contents. Documate/Plus supports up to 8 levels of sub-indexing, and you can choose to index either words or phrases. (*The Orthocode Corporation™*)

### **Spellguard™**

Spellguard is a computer program that helps the user to eliminate spelling and typographical errors in written materials prepared with WordStar. Two dictionaries are supplied with Spellguard: the first consists of 20,000 of the most frequently used words in the English language and the second contains 10,000 words and can be easily expanded to include technical vocabulary and/or foreign languages. (*Sorcim™*)

### **muMATH-80™**

muMATH-80 is a fully interactive Symbolic Math System that efficiently and accurately performs true algebraic and analytic operations. muMATH can evaluate and simplify expressions containing variables that have not been assigned numeric values. The muSIMP-80™ programming language is provided with this package to extend muMATH or to implement other Artificial Intelligence applications. However, most Osborne users will find muMATH sufficiently powerful to handle the majority of their mathematical problems. (*The Soft Warehouse™*)

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This program interacts with WordStar to add basic math capability to your Osborne computer. Math\* performs addition, subtraction, multiplication and division. Within your WordStar document, Math\* allows you to perform math functions in either rows or columns. (*Force Two®*)

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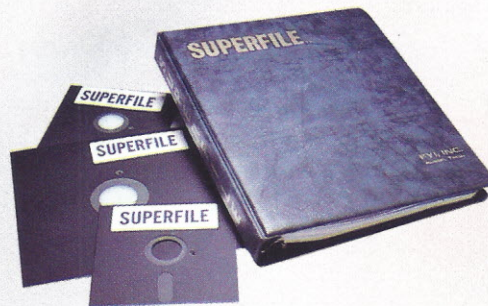
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